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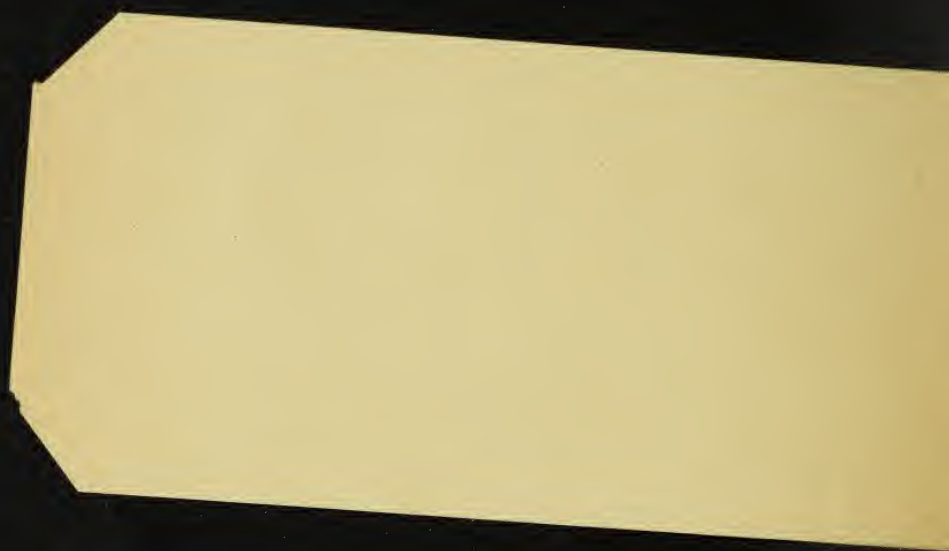
DEPARTMENT OF AGRICULTURE.

CAPITOL BUILDING,
TOPEKA.

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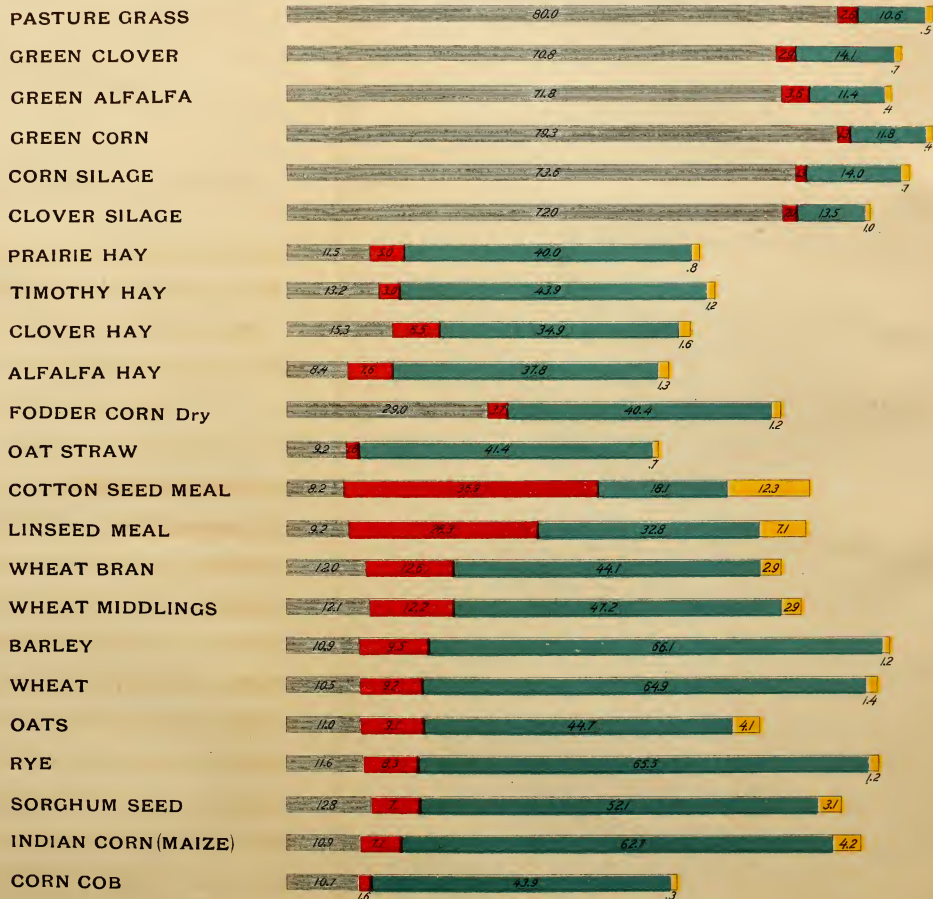
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COMPOSITION OF FEEDING STUFFS

Table showing Pounds of Water and of Digestible Matter in 100 lbs.

WATER  DIGESTIBLE PROTEIN  DIGEST. CARBOHYDRATES  DIGEST. FAT 

[By courtesy of the Wisconsin Agricultural Experiment Station.]

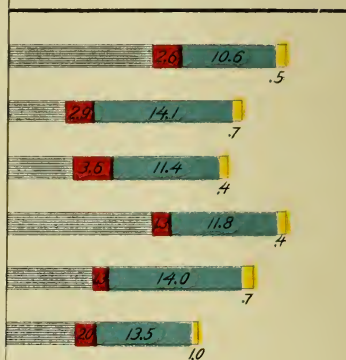


STUFFS

100 lbs.

DIGEST. FAT

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NOV 23 1919

NINTH BIENNIAL REPORT

OF THE

KANSAS

State Board of Agriculture,

TO THE

LEGISLATURE OF THE STATE,

FOR THE YEARS 1893 AND 1894.

CONTAINING DESCRIPTIVE STATEMENTS, STATISTICS, AND GENERAL INFORMATION
RELATING TO EACH COUNTY, AND

THE GEOGRAPHICAL AND TOPOGRAPHICAL FEATURES OF THE STATE,

TOGETHER WITH

TABLES, STATEMENTS, SUMMARIES AND DIAGRAMS SHOWING THE PRODUCTS, PROGRESS
AND DEVELOPMENT OF THE STATE; REPORTS OF THE APPOINTED
OFFICERS OF THE BOARD, AND GENERAL AG-
RICULTURAL INFORMATION.

TOPEKA.

PRESS OF THE HAMILTON PRINTING COMPANY:

EDWIN H. SNOW, State Printer.

1895.

KANSAS STATE BOARD OF AGRICULTURE.

1895.

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OFFICE OF THE STATE BOARD OF AGRICULTURE,
TOPEKA, KANSAS, January 15, 1895.

To His Excellency E. N. MORRILL, Governor of Kansas:

We have the honor to transmit herewith the ninth biennial report of the Kansas State Board of Agriculture, for the years 1893 and 1894.

Very respectfully,

THOS. M. POTTER, *President.*

F. D. COBURN, *Secretary.*

431839

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INTRODUCTORY.

OFFICE OF THE STATE BOARD OF AGRICULTURE,
CAPITOL BUILDING, TOPEKA, January 15, 1895.

To the Legislature of Kansas:

THE ninth biennial report of the Kansas State Board of Agriculture is herewith presented, but to appear later by some months than it should, owing to a lack of available funds for its earlier printing.

The biennial period to which it relates has been, for Kansas, in common with all her sister states, one of less than usual prosperity. This has been due not alone to the two unfavorable crop seasons which in succession have been common to so many portions of the union, but also to the general depression existent in nearly all business channels throughout the world. Yet, in spite of so many extraordinarily adverse conditions, Kansas, as a whole, has not failed in the production of tremendous quantities of the great staples, which conduce to comfort and prosperity at home and command gold in the markets of the world.

The truth of this is readily discernible in the table on the next page, which shows her agricultural output during the two years under notice, together with their values.

The details of that table, by counties, are made plain in the succeeding pages, along with much other information intended to be instructive and helpful. A state evolved within a third of a century from a wilderness, and which, in the two most unpropitious years of her history, as to both agricultural and financial conditions, produces from her soil the necessities and luxuries of life to the extent of \$236,000,000, has small occasion to feel humiliated, but on the other hand has demonstrated, once and for all, the tremendous resources of her soil and people, even under circumstances the most adverse.

Shortage of crops in various portions of the state the past two years, from lack of seasonable rainfall, has caused the question of irrigation

KANSAS' AGRICULTURAL PRODUCTIONS IN 1893-94.

		Quantities.	Value.
Winter wheat.....	bu.	52,810,070	\$22,239,915 76
Spring wheat.....	bu.	223,153	90,813 41
Corn.....	bu.	185,577,202	57,975,952 83
Oats.....	bu.	46,580,186	11,559,885 77
Rye.....	bu.	2,041,677	815,792 06
Barley.....	bu.	1,050,275	404,384 84
Buckwheat.....	bu.	23,058	15,691 50
Irish potatoes.....	bu.	9,212,300	6,075,580 99
Sweet potatoes.....	bu.	640,062	508,277 18
Castor beans.....	bu.	69,083	73,394 75
Sorghum.....	bu.	*	3,675,904 80
Cotton.....	lbs.	40,200	2,750 00
Flax.....	bu.	1,805,827	1,691,465 65
Tobacco.....	lbs.	202,300	20,230 00
Broom corn.....	lbs.	65,786,478	1,745,917 64
Millet and Hungarian.....	tons	878,846	3,650,356 00
Milo maize, 1893.....	tons	34,670	} 170,876 50
Milo maize, 1894.....	bu.	144,740	
Kafir corn, 1893.....	tons	128,857	} 1,080,454 00
Kafir corn, 1894.....	bu.	1,387,769	
Jerusalem corn, 1893.....	tons	26,962	} 215,054 50
Jerusalem corn, 1894.....	bu.	295,299	
Timothy.....	tons	} 1,179,401	7,076,406 00
Clover.....	tons		
Blue grass.....	tons		
Alfalfa.....	tons		
Orchard grass.....	tons		
Other tame grasses.....	tons	} 2,952,452	11,511,554 75
Prairie, under fence.....	tons		
Total.....			\$130,600,658 99
Wool clip.....	lbs.	2,102,088	\$307,550 52
Cheese.....	lbs.	686,724	78,747 27
Butter.....	lbs.	54,759,824	8,761,571 84
Animals slaughtered or sold for slaughter.....			84,844,461 00
Milk sold other than that sold for butter and cheese.....			876,901 00
Poultry and eggs sold.....			7,065,097 00
Garden products marketed.....			1,566,443 00
Horticultural products marketed.....			986,417 00
Wine manufactured.....	gals.	399,822	399,822 00
Honey and beeswax produced.....	lbs.	762,977	138,751 38
Wood marketed.....			300,035 00
Total.....			\$105,325,802 01
Grand total.....			\$235,926,461 00

* Syrup and forage.

and the extent of the available water supply and its possibilities to be much studied by our people, many of whom have gone actively to work to develop them through individual enterprise, and with results thus far eminently satisfactory and encouraging. The ascertainment and utilization of the underground waters, a judicious catchment, conservation and use of the storm waters heretofore so largely wasted, the deeper, more thorough breaking up of compacted, impervious subsoils, a better understanding of what crops are best adapted to the different sections, along with a more thorough system of agriculture (which are now subjects of profound study), promise an increased and constantly increasing prosperity. Instead of vast ranges, sparse settlements, slipshod ranch farm-

ing, wheat kings, and cattle barons, this will mean intensive farming—a land of small homes, modest competence, and communities contented because comfortable.

The conditions which have prevailed, whatever their effects elsewhere, are to result in a new agriculture and a new prosperity for Kansas, upon which we are now entering. The ways and means of these are suggested in the talismanic words, the magic quartette, "Irrigation," "Subsoiling," "Alfalfa," and "Sorghum."

The first of these has so far progressed as to demonstrate the entire feasibility of assuring crops annually, regardless of seasonable rainfall, by fructifying with the extensive underground water supply (independent of streams) a very considerable percentage of our most fertile lands, in the western two-thirds of the state especially, where retarded rainfall during the growing months has not infrequently made the profits of agriculture quite uncertain. The pumping of these waters will in large measure be inexpensively done, by harnessing to the work the ever-present breezes, which, shot through and through with sunshine, are wafted across our broad prairies and give the ideal healthful climate for all breathing things, and for developing the choicest growths of grain, fruit, and flower.

By means of subsoiling, there will be stored in the soil, for use when most needed, much of the usually sufficient rainfall now permitted to waste itself and do actual damage as run-off.

The wonderful plant alfalfa is proving itself not only one of the most reliably productive, useful and profitable field crops known to our agriculture, but also especially adapted to the soil conditions prevailing in those sections of the state where some of the better-known staple crops are not always reliably productive. A like description applies to the sorghums, and particularly some of the nonsaccharine varieties known as Kaffir corn, Milo maize, and Jerusalem corn, which, under even phenomenally adverse conditions, give prodigious yields of superior forage, and wholesome, nutritious grain for that live stock which, under the new environment, must necessarily become highly developed, and will likewise be so much of a factor in our material advancement.

It is the object of the Board of Agriculture to be practically, helpfully

useful in the everyday affairs of the people whose servant it is, and to accomplish this, it must have their cordial, generous support. If restricted to meager means and equipment, its usefulness to its employers is restricted and made inefficient in a like ratio.

At the annual meeting of the Board in 1894, Hon. Martin Mohler retired, after six years of faithful, arduous work as its Secretary, with the good will and wishes of all its members.

The thanks of the Board are due to Mr. E. W. Longshore, the long-time chief clerk in its office, who has been especially in charge of the very important statistical work—the excellence of which speaks for itself—and to the faithful assistant, Mr. J. C. Mohler; also the various officials, members and correspondents who have so heartily coöperated in giving value to the Board's undertakings.

THOS. M. POTTER, *President.*

F. D. COBURN, *Secretary.*

POPULATION, PRODUCTION, ASSESSED VALUATION, ETC.

ALLEN COUNTY.

Organized in 1855; contains 504 square miles; is the 48th county in population. Iola, in the west-central portion, on the Neosho river, is the county seat. It has fine water power, a large flouring mill, and an abundance of natural gas, which is used for fuel and for lighting both houses and streets. Humboldt, seven miles southwest of Iola, on the Neosho river, also has fine water power, natural gas, and is a good trade center, surrounded by a rich farming country. Morantown, in the east-central portion of the county, Savonburg, Elsmore and Bayard in the eastern, La Harpe in the central, and Carlyle and Geneva in the northwestern portion, are places of local importance, each doing an extensive business in shipping live stock and grain.

The railroads in the county are: The Fort Scott, Wichita & Western, operated by the Missouri Pacific; Southern Kansas and Chicago, Kansas & Western, by the Atchison, Topeka & Santa Fé; and the Kansas City & Pacific, by the Missouri, Kansas & Texas.

The principal streams are the Neosho and Marmaton rivers. Bottom lands average $1\frac{1}{2}$ miles in width, and in the aggregate comprise about 10 per cent. of the county area. All varieties of timber met with in Kansas are grown in this county. Belts of timber skirt all the streams, and average about one mile in width on the Neosho

POPULATION AND VALUATION.—ALLEN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	12,372	12,770	\$2,066,127	\$434,327	\$322,525	\$554,419	\$3,377,398
Carlyle twp.	592	598	\$129,340	\$23,803	.....	\$53,349	\$206,492
Cottage Grove twp. .	800	800	156,165	19,813	.....	25,405	201,383
Deer Creek twp.	464	470	136,380	15,119	.....	.....	151,499
Elm twp.	777	806	197,790	36,460	.....	50,418	284,668
Savonburg city.	153	293	.....	.....	.....	.....	.....
Elsmore city.	155	343	1,540	34,445	.....	50,254	325,689
Elsmore twp.	1,239	904	.....	.....	.....	.....	.....
Geneva twp.	452	580	124,547	28,955	.....	21,258	174,760
Humboldt city.	1,324	1,410	1,870	115,685	\$117,300	56,595	344,450
Humboldt twp.	479	460	.....	.....	.....	.....	.....
Iola city.	1,433	1,565	211,970	97,195	172,025	112,168	593,358
Iola twp.	1,023	1,000	134,300	14,440	.....	49,248	197,988
Logan twp.	466	422	.....	.....	.....	.....	.....
Morantown.	464	501	229,460	47,306	33,200	96,336	406,302
Marmaton twp.	896	953	.....	.....	.....	.....	.....
Osage twp.	870	874	201,380	34,383	.....	39,388	275,151
Stalen twp.	785	791	188,120	27,538	.....	.....	215,658

river and larger creeks. Well water is easily obtained at an average depth of 25 feet, and springs are plentiful everywhere.

Sandstone is found in the southern and eastern portions, while limestone is abundant everywhere. A small vein of mineral paint has been discovered in the northwest portion of Osage township; also one a short distance west of Iola. An excellent quality of fire clay is found about three miles northeast of Iola; also, deposits three-fourths of a mile northeast and one-half of a mile south of the city are reported. A small vein of gypsum is found 2½ miles southeast of Morantown. At Iola a mineral well is utilized for medical purposes. Quarries of a fine quality of

FARM AND CROP STATISTICS.—ALLEN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	7,741	72,369	\$83,289 74	3,565	51,904	\$21,799 68
Spring wheat.....bu.	45					
Corn.....bu.	73,795	1,328,310	358,643 70	72,278	1,301,004	455,351 40
Oats.....bu.	25,435	534,135	106,827 00	19,717	417,397	104,349 25
Rye.....bu.	248	3,720	1,674 00	187	1,496	673 20
Barley.....bu.	77	1,155	519 75	1	20	8 00
Buckwheat.....bu.	10	80	60 00	4	32	19 20
Irish potatoes.....bu.	514	51,400	32,332 00	727	65,430	37,295 10
Sweet potatoes.....bu.	3	300	300 00	7	1,050	619 50
Castor beans.....bu.	62	496	570 40	37	444	444 00
Sorghum.....bu.	427		9,013 00	422		12,557 00
Flax.....bu.	6,225	43,575	37,038 75	8,036	80,360	80,360 00
Tobacco.....lbs.	10					
Broom corn.....lbs.	3,017	1,508,500	37,712 50	2,050	1,025,000	41,000 00
Millet and hungarian, tons	6,930	12,127	36,351 00	5,742	8,613	34,452 00
Milo maize.....tons	1	4	14 00	14	280	126 00
Kafir corn.....tons	905	3,620	12,670 00	1,874	37,480	18,740 00
Jerusalem corn.....tons	21	42	126 00	25	625	312 50
Timothy.....tons	7,998			12,791		
Clover.....tons	2,839			1,719		
Blue grass.....tons	1,839	* 5,355	32,130 00	1,632	† 8,353	50,118 00
Alfalfa.....tons	23			30		
Orchard grass.....tons	28			33		
Other tame grasses.....tons	999			456		
Prairie grass, fenced.....tons	46,552	19,631	49,077 50	58,808	25,566	76,698 00
Totals.....	185,744		\$748,429 34	190,155		\$934,922 83

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.
Wheat on hand March 1, 1893, 1,436 bushels; March 1, 1894, 15,999 bushels.
Corn on hand March 1, 1893, 228,562 bushels; March 1, 1894, 217,322 bushels.

SUMMARY.—ALLEN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	185,744	\$748,429 34	190,155	\$934,922 83
Animals slaughtered and sold for slaughter.....		314,154 00		371,028 00
Milk sold.....		810 00		130 00
Poultry and eggs sold.....		36,446 00		50,894 00
Wool clip.....lbs.	1,424	227 84	2,175	282 75
Cheese.....lbs.	5,560	611 60	16,500	1,980 00
Butter.....lbs.	292,758	46,841 28	305,385	48,861 60
Garden products marketed.....		2,415 00		1,556 00
Horticultural products.....		723 00		349 00
Honey and beeswax.....lbs.	6,055	1,105 86	1,764	317 52
Wine manufactured.....gals.	120	120 00	520	520 00
Wood marketed.....		1,064 00		476 00
Totals.....		\$1,152,947 92		\$1,411,317 70

marble have been discovered near the city of Iola, and in other places in the county. This marble is susceptible of a high polish, and is tough in texture. It is found in all shades of gray, and in purple and mahogany colors. It is said to be nearly 3 per cent. purer than the Italian, is very abundant, and easy of access. The United States government assay places the quality of the stone at 98 per cent. pure marble.

LIVE STOCK.—ALLEN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	9,019	\$468,988 00	8,896	\$293,568 00
Mules and asses	984	61,008 00	1,025	43,050 00
Milch cows	5,994	119,880 00	5,799	127,578 00
Other cattle	12,956	220,252 00	11,287	203,166 00
Sheep	451	1,127 50	263	657 50
Swine	12,642	94,815 00	15,975	111,825 00
Totals	42,046	\$966,070 50	43,245	\$779,844 50

Number of dogs in county March 1, 1893, 1,452; March 1, 1894, 1,040.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

ANDERSON COUNTY.

Organized in 1855; has an area of 576 square miles, and ranks as the 46th county in population in the state. The county seat is Garnett, north and east of the center of the county. The towns of Greeley, Kincaid, Colony and Westphalia are places of local importance.

The county is well supplied with railroads, having the Kansas, Nebraska & Dakota, Kansas & Arizona, and St. Louis & Emporia, all of which are operated as part

POPULATION AND VALUATION.—ANDERSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	12,172	13,275	\$1,854,339	\$708,535	\$382,234	\$748,225	\$3,693,333
Indian Creek twp ...	590	656	\$119,607	\$17,132	.....	\$36,849	\$173,588
Jackson twp.	771	793	119,773	31,386	\$18,280	49,659	219,093
Lincoln twp.	664	785	159,603	29,732	1,600	38,808	229,743
Lone Elm twp.	850	815	144,114	45,944	3,494	28,273	220,925
Garnett city.	1,938	2,353	133,942	168,200	225,815	101,799	629,756
Monroe twp.	626	621	2,974				
Colony city.	487	456	974	109,631	63,608	42,190	96,472
Ozark twp.	515	518	1,002	63,608			311,901
Putnam twp.	562	563	119,909	51,337	.....	33,503	204,749
Reeder twp.	927	1,061	233,135	68,887	11,102	42,911	356,035
Kincaid city.	256	294	1,009	179,280	72,288	19,922	120,849
Rich twp.	591	715	1,009	93,833	16,137	.....	109,970
Union twp.	510	503	93,833	16,137	.....	.....	.....
Greeley city.	407	381	651	56,439	30,108	31,788	19,768
Walker twp.	268	270	651	56,439	30,108	31,788	19,768
Washington twp.	585	632	107,724	19,282	6,328	82,778	216,112
Welda twp.	592	777	117,137	25,540	4,947	49,948	197,572
Westphalia city.	260	311	1,082	160,212	69,854	16,768	46,608
Westphalia twp.	773	771	1,082	160,212	69,854	16,768	46,608

of the Missouri Pacific system; the Southern Kansas and Chicago, Kansas & Western, parts of the Atchison, Topeka & Santa Fé system; and Kansas City & Pacific, operated by the Missouri, Kansas & Texas Railway Company.

The surface of Anderson county is gently undulating. The bottoms along the creeks average one-half to one mile in width, making about 10 per cent. of the entire county area. The timber belts on the creeks average from 40 rods to one mile in width, and in them are found nearly all the varieties of timber known in Kansas. Springs are not abundant; but some few valuable ones have been developed. The largest stream in the county is Pottawatomie creek.

FARM AND CROP STATISTICS.—ANDERSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	6,915	78,000	\$35,100 00	3,906	42,644	\$17,910 48
Spring wheat.....bu.	188	1,316	526 40	41	287	114 80
Corn.....bu.	72,778	2,183,340	545,835 00	78,884	1,489,296	536,146 56
Oats.....bu.	23,138	578,450	115,690 00	14,635	269,284	72,706 68
Rye.....bu.	241	1,928	771 20	259	3,108	1,460 76
Barley.....bu.	135	1,215	546 75	51	612	244 80
Buckwheat.....bu.	15	120	90 00	3	24	14 40
Irish potatoes.....bu.	563	39,410	27,587 00	703	31,635	18,981 00
Sweet potatoes.....bu.	11	660	660 00	15	750	420 00
Castor beans.....bu.	62	496	570 40	83	830	830 00
Sorghum.....bu.	341	.....	5,785 00	178	.....	3,200 00
Flax.....bu.	7,376	59,008	50,156 80	8,270	82,700	82,700 00
Tobacco.....lbs.	10	.....	.....	.....	.....	.....
Broom corn.....lbs.	33	16,500	412 50	5	.....	.....
Millet and hungarian, tons	3,593	5,389	26,945 00	2,842	5,684	22,736 00
Milo maize.....tons	36	† 144	504 00	23	460	207 00
Kafir corn.....tons	224	† 896	3,136 00	267	5,340	2,670 00
Jerusalem corn.....tons	25	† 50	150 00	14	280	140 00
Timothy.....tons	18,673	.....	.....	20,307	.....	.....
Clover.....tons	2,926	.....	.....	1,831	.....	.....
Blue grass.....tons	1,828	.....	.....	698	.....	.....
Alfalfa.....tons	.....	* 10,027	60,162 00	1	† 16,272	97,632 00
Orchard grass.....tons	9	.....	.....	4	.....	.....
Other tame grasses.....tons	311	.....	.....	2,657	.....	.....
Prairie grass, fenced...tons	68,575	17,876	53,628 00	65,248	23,551	94,204 00
Totals.....	208,006	.....	\$928,256 05	200,425	.....	\$952,318 48

Wheat on hand March 1, 1893, 1,641 bushels; March 1, 1894, 16,631 bushels.

Corn on hand March 1, 1893, 263,355 bushels; March 1, 1894, 259,850 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—ANDERSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	208,006	\$928,256 05	200,425	\$952,318 48
Animals slaughtered and sold for slaughter.....	.....	695,699 00	.....	559,865 00
Milk sold.....	.....	5,403 00	.....	7,166 00
Poultry and eggs sold.....	.....	27,977 00	.....	33,197 00
Wool clip.....lbs.	8,275	1,324 00	5,140	668 20
Cheese.....lbs.	19,390	2,132 90	31,205	3,744 60
Butter.....lbs.	251,093	40,174 88	248,114	39,698 24
Garden products marketed.....	.....	4,378 00	.....	3,219 00
Horticultural products.....	.....	25,217 00	.....	546 00
Honey and beeswax.....lbs.	8,273	1,493 34	4,675	817 80
Wine manufactured.....gals.	3,066	3,066 00	2,349	2,349 00
Wood marketed.....	.....	13,619 00	.....	3,397 00
Totals.....	.....	\$1,748,740 17	.....	\$1,606,956 32

Limestone and sandstone are found in all portions of Anderson county, except southwestern. The stone is easily quarried, and many quarries are in operation. A thin vein of coal from 12 to 14 inches thick has been discovered near Colony. Fire clay is found in small quantities near the city of Garnett.

LIVE STOCK.—ANDERSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	9,250	\$481,000 00	9,210	\$303,930 00
Mules and asses	1,255	77,810 00	1,487	62,454 00
Milch cows	5,966	119,320 00	5,947	130,884 00
Other cattle	15,087	256,479 00	15,155	272,790 00
Sheep	782	1,955 00	990	2,475 00
Swine	15,737	118,027 50	23,994	167,958 00
Totals	48,077	\$1,054,591 50	56,783	\$940,441 00

Number of dogs in county March 1, 1893, 1,517; March 1, 1894, 1,707.

Number of sheep killed by dogs, year ending March 1, 1894, 35.

ATCHISON COUNTY.

Was organized in 1855, under the territorial government; has an area of 423 square miles, and ranks as the ninth county in point of population. Its county seat is the city of Atchison, on the Missouri river, north of the center of the county, and commands a large wholesale trade both north and west. The towns of Huron, Lancaster, Monrovia, Effingham and Muscotah do a considerable trade with the surrounding county. Creameries are in operation at Huron and Effingham.

The railroads in the county are: The Missouri Pacific and Central Branch, operated by the former; Burlington & Missouri River, and Atchison, Topeka & Santa Fé; with the Kansas City, St. Joseph & Council Bluffs, Hannibal & St. Joseph, and Chicago, Rock Island & Pacific.

POPULATION AND VALUATION.—ATCHISON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal township and cities in March, 1894.

Townships and cities.	*Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	26,352	26,455	\$1,694,900	\$687,770	\$1,679,760	\$839,440	\$4,901,870
Benton twp.	1,579	1,633	\$212,480	\$43,340	\$20,970	\$46,120	\$322,910
Center twp.	1,514	1,537	194,250	26,950	5,890	113,630	340,720
Grasshopper twp.	1,841	1,869	230,170	28,050	19,210	45,090	322,520
Kapioma twp.	1,146	1,183	130,210	16,420	4,520	36,720	187,870
Lancaster twp.	1,492	1,657	257,800	44,740	19,160	70,760	392,460
Mount Pleasant twp.,	1,366	1,337	176,290	21,180	3,360	119,790	320,620
Shannon twp.	2,112	1,984	377,170	75,680	15,710	161,520	630,080
Walnut twp.	1,324	1,277	116,580	7,630	.....	135,090	259,250
Atchison city:							
1st ward.	1,443	1,443	.....	423,780	1,590,940	110,720	2,125,440
2d ward.	2,258	2,258					
3d ward.	3,717	3,717					
4th ward.	2,390	2,390					
5th ward.	4,170	4,170					

*1891 and 1892; no returns for 1893 and 1894.

Prominent bluffs occur along the Missouri river, while the remainder of the county is gently undulating. Bottoms average from one-fourth of a mile to a mile and one-half in width, and in the aggregate make 15 per cent. of the county area. Timber is found on all of the streams, in belts varying from one-fourth of a mile to a mile and one-half in width. Black walnut, bur oak, black oak, white oak, hickory, red elm and honey locust are the prominent varieties.

Limestone is found in all parts of Atchison county, the best being on Delaware river and its tributaries. An excellent quality of blue limestone is found, and

FARM AND CROP STATISTICS.—ATCHISON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	23,478	187,820	\$108,935 60	18,710	341,817	\$153,817 65
Spring wheat.....bu.	260	2,340	1,170 00	7		
Corn.....bu.	68,804	2,339,356	584,834 00	66,094	1,454,068	552,545 84
Oats.....bu.	16,401	360,822	79,380 84	12,424	308,109	80,108 34
Rye.....bu.	283	4,528	1,811 20	538	8,608	3,959 68
Barley.....bu.	2	1,040	468 00	140	2,800	1,120 00
Buckwheat.....bu.	2	20	15 00			
Irish potatoes.....bu.	1,954	224,710	157,297 00	2,821	174,902	73,458 84
Sweet potatoes.....bu.	45	3,825	3,825 00	48	2,880	2,880 00
Castor beans.....bu.						
Sorghum.....bu.	47		790 00	93		1,785 00
Flax.....bu.	456	3,648	3,100 80	290	2,900	2,900 00
Tobacco.....lbs.	35			20	12,000	1,200 00
Broom corn.....lbs.				55	22,000	1,100 00
Millett and hungarian, tons	1,414	2,828	14,140 00	1,515	2,652	13,260 00
Milo maize.....tons						
Kaffir corn.....tons	4	‡ 16	56 00	2	40	20 00
Jerusalem corn.....tons						
Timothy.....tons	22,945	* 13,304	79,924 00	20,202	† 13,308	79,848 00
Clover.....tons	2,256			2,999		
Blue grass.....tons	12,323			10,909		
Alfalfa.....tons	26			31		
Orchard grass.....tons	16			29		
Other tame grasses.....tons	792	4,478	17,912 00	1,488	3,814	19,070 00
Prairie grass, fenced.....tons	7,313			7,802		
Totals.....	158,906		\$1,053,660 04	146,217		\$987,073 35

Wheat on hand March 1, 1893, 59,055 bushels; March 1, 1894, 41,886 bushels.

Corn on hand March 1, 1893, 536,333 bushels; March 1, 1894, 673,150 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—ATCHISON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	158,906	\$1,053,660 04	146,217	\$987,073 35
Animals slaughtered and sold for slaughter.....		539,596 00		444,010 00
Milk sold.....		22,815 00		13,388 00
Poultry and eggs sold.....		22,862 00		23,358 00
Wool clip.....lbs.	2,930	468 80	750	97 50
Cheese.....lbs.	4,750	522 50	4,850	582 00
Butter.....lbs.	259,416	41,506 56	248,978	39,836 48
Garden products marketed.....		21,358 00		22,699 00
Horticultural products.....		15,806 00		10,148 00
Honey and beeswax.....lbs.	13,708	2,483 96	4,250	767 50
Wine manufactured.....gals.	8,110	8,110 00	13,840	13,840 00
Wood marketed.....		4,677 00		6,044 00
Totals.....		\$1,733,865 86		\$1,561,843 83

proves to be very durable for flagging. Stone coal of an inferior quality, though abundant, is reported to underlie the first three strata of stone. Deposits of clay, suitable for the manufacturing of a superior quality of brick for building purposes, and vitrified brick for paving streets, have been found within one-half mile from the city of Atchison. Large plants are extensively working these deposits, and vast quantities of both pressed and vitrified bricks are being shipped.

Springs are abundant throughout Atchison county, and well water is found at an average depth of 25 feet. The county is well supplied with small streams, and, in addition to the Missouri river, has three streams of considerable importance—the Independence, Delaware and Stranger rivers.

LIVE STOCK.—ATCHISON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	7,890	\$409,760 00	7,794	\$257,202 00
Mules and asses.....	1,281	79,422 00	1,295	54,390 00
Milch cows.....	5,978	119,560 00	5,267	115,874 00
Other cattle.....	10,984	186,728 00	11,152	200,736 00
Sheep.....	4,337	10,842 50	405	1,012 50
Swine.....	14,773	110,797 50	21,913	153,391 00
Totals.....	45,233	\$917,110 00	47,826	\$782,605 50

Number of dogs in county March 1, 1893, 2,567; March 1, 1894, 2,428.

Number of sheep killed by wolves, year ending March 1, 1894, 2.

BARBER COUNTY.

It has an area of 1,134 square miles, and is the 73d county in population. Was organized in 1873. Medicine Lodge, north and east of the center, is the county seat. Extensive sorghum sugar works are in successful operation at this place. Cost of factory and real estate, \$125,000. Kiowa and Hazelton are places of importance.

The Fort Scott, Wichita & Western railroad, a part of the Missouri Pacific system, and the Atchison, Topeka & Santa Fé, cross the southeastern corner of the county. The Southern Kansas, a part of the Atchison, Topeka & Santa Fé, enters the county on the east, and extends to Medicine Lodge.

The surface of the eastern half of the county is undulating, some portions being nearly level; the western half is broken and bluffly along the streams. Bottom lands in the eastern portion vary from one-half mile to two miles in width, while they are much narrower in the western half. The proportion of bottom land is about 20 per cent. of the total area of the county. Timber belts average one-half mile in width, and contain the following varieties: Walnut, elm, cottonwood, hackberry, ash, mulberry, cedar, and willow. The county is well supplied with streams, all having a southeastern course—the principal of which is the Medicine river, flowing across the county diagonally from the northwest to the southeast. Springs are abundant, and well water is reached at an average depth of 10 feet on the bottom lands.

A poor quality of soft red sandstone is abundant on high lands along the streams. An excellent quality of fire clay is found in several localities from 8 to 25

feet below the surface. A good bed of clay for brickmaking has been found on the Medicine river, near the city of Medicine Lodge, and a light colored stone, resembling limestone, in the central portion of the county. Gypsum is abundant in the

POPULATION AND VALUATION.—BARBER COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	9,378	5,753	\$2,002,286	\$192,821	\$246,044	\$248,105	\$2,689,256
Etna twp.....	184	118	\$156,210	\$7,280	\$797		\$164,287
Cedar twp.....	380	288	75,055	8,395		\$10,185	93,635
Deerhead twp.....	134	95	93,340	3,165	42		96,547
Eagle twp.....	392	205	169,230	9,525			178,755
Elm Mills twp.....	312	205	102,955	4,800			107,755
Elwood twp.....	496	262	165,885	19,078	770		185,733
Hazelton city.....	429 } 812	259 } 575	83,020	21,360	48,557	71,580	224,517
Hazelton twp.....	383 }	316 }					
Kiowa city.....	1,358 } 504	504 }	104,265	24,526	52,724	49,852	231,367
Kiowa twp.....	355 }	142 }					
Lake City twp.....	211	146	54,780	7,882	6,002		68,664
McAdoo twp.....	209	144	59,669	4,140			63,809
Medicine Lodge city.	1,276 } 648	648 }	289,407	40,650	128,407	52,905	511,369
Medicine Lodge twp.	717 }	508 }					
Mingona twp.....	456	280	91,140	7,235	566		98,941
Moore twp.....	417	314	86,020	5,170		224	91,414
Nippawalla twp.....	380	237	98,815	8,110			106,425
Sharon twp.....	668	541	163,635	7,854	4,292	35,408	211,189
Sun City twp.....	147	135	60,210	2,780	2,722		65,712
Turkey Creek twp...	186	167	71,020	7,390			78,410
Valley twp.....	288	239	78,130	3,481	1,165	27,951	110,727

FARM AND CROP STATISTICS.—BARBER COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	80,407	160,812	\$64,324 80	74,829	251,424	\$93,026 88
Spring wheat.....bu.	77					
Corn.....bu.	28,449	113,796	45,518 40	39,150	313,200	128,412 00
Oats.....bu.	12,362	98,896	31,646 72	7,193	19,410	7,181 70
Rye.....bu.	773			464	4,640	1,995 20
Barley.....bu.	2,452			1,038	12,456	5,605 20
Buckwheat.....bu.	4					
Irish potatoes.....bu.	268	8,040	8,040 00	171	8,892	8,892 00
Sweet potatoes.....bu.	44	1,452	1,452 00	16	1,600	1,760 00
Castor beans.....bu.	1	3	3 45			
Sorghum.....bu.	6,319		75,824 00	6,417		211,740 00
Flax.....bu.				40		
Tobacco.....lbs.				10	6,000	600 00
Broom corn.....lbs.	180	90,000	2,250 00	85		
Millet and hungarian, tons	3,010	3,010	9,030 00	1,878	2,817	8,451 00
Milo maize.....tons	233	† 699	2,446 00	347	8,675	3,903 75
Kafir corn.....tons	765	† 3,060	10,710 00	2,363	54,349	27,174 50
Jerusalem corn.....tons		†		67	3,350	1,675 00
Timothy.....tons	16					
Clover.....tons	11			7		
Blue grass.....tons	4					
Alfalfa.....tons	902	* 10,587	63,522 00	856	† 595	3,570 00
Orchard grass.....tons				10		
Other tame grasses.....tons	1			23		
Prairie grass, fenced..tons	23,991	3,824	15,296 00	66,790	1,002	5,010 00
Totals.....	160,269		\$330,063 37	201,754		\$508,997 23

Wheat on hand March 1, 1893, 39,159 bushels; March 1, 1894, 20,070 bushels.

Corn on hand March 1, 1893, 52,154 bushels; March 1, 1894, 7,040 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

central and west portions. A gypsum factory is in successful operation at Medicine Lodge which manufactures a product known as "Robinson cement." It is a very superior plastering material and is constantly growing in favor.

SUMMARY.—BARBER COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	160,269	\$330,063 37	201,754	\$508,997 23
Animals slaughtered and sold for slaughter.....		271,396 00		218,547 00
Milk sold.....		1,095 00		720 00
Poultry and eggs sold.....		11,095 00		9,944 00
Wool clip.....lbs.			11,500	1,495 00
Cheese.....lbs.	50	5 50	1,300	156 00
Butter.....lbs.	153,942	24,630 72	137,692	22,030 72
Garden products marketed.....		1,402 00		595 00
Horticultural products.....		705 00		1,678 00
Honey and beeswax.....lbs.	302	54 50	25	4 50
Wine manufactured.....gals.	383	383 00	52	52 00
Wood marketed.....		723 00		952 00
Totals.....		\$641,553 09		\$765,171 45

LIVE STOCK.—BARBER COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	7,647	\$397,644 00	5,800	\$191,400 00
Mules and asses.....	1,229	76,198 00	988	41,496 00
Milch cows.....	3,879	77,589 00	2,469	54,318 00
Other cattle.....	21,698	368,866 00	12,428	223,704 00
Sheep.....	991	2,477 50	1,308	3,270 00
Swine.....	4,945	37,087 50	3,968	27,776 00
Totals.....	40,389	\$959,853 00	26,961	\$541,964 00

Number of dogs in county March 1, 1893, 1,458; March 1, 1894, 961.

Number of sheep killed by wolves, year ending March 1, 1894, 51.

BARTON COUNTY.

Was organized in 1872, and has an area of 900 square miles. Ranks as the 45th county in population. Great Bend, situated on the Arkansas river, in the south-central portion, is the county seat. The towns of Hoisington, in the central portion, Ellinwood in the southeastern, and Pawnee Rock in the southwestern, have considerable trade with the surrounding country.

The Atchison, Topeka & Santa Fé railroad, and the Kansas & Colorado, a part of the Missouri Pacific system, extend through the county in a westerly direction.

The south half portion of the surface of the county is level, while the north half is higher and somewhat broken. Bottoms on the Arkansas river and Walnut creek average from two to seven miles in width. The proportion of bottom land to up-land is about 40 per cent. Narrow belts of the following varieties of timber are found along all the streams: Cottonwood, ash, box elder, hackberry, elm, willow, walnut, and some mulberry. Timber is cultivated in all portions of the county.

POPULATION AND VALUATION.—BARTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	13,776	13,448	\$1,319,212	\$923,078	\$297,639	\$743,758	\$2,683,687
Albion twp.....	392	361	\$50,023	\$4,913	.....	\$12,131	\$67,067
Beaver twp.....	312	316	46,995	2,725	.....	.....	49,720
Buffalo twp.....	369	414	66,920	10,504	\$683	33,091	111,198
Cheyenne twp.....	716	714	88,019	9,281	.....	41,637	138,937
Clarence twp.....	343	401	60,828	8,701	.....	.....	69,529
Cleveland twp.....	360	366	46,281	4,091	.....	.....	50,372
Comanche twp.....	725	738	77,430	8,550	.....	.....	85,980
Eureka twp.....	317	297	56,243	7,040	.....	37,962	101,245
Fairview twp.....	302	330	46,742	5,726	.....	.....	52,468
Grant twp.....	320	371	43,520	1,743	.....	20,786	66,049
Great Bend city.....	2,720	2,506	.....	.....	.....	.....	.....
Great Bend twp.....	474	439	2,945	79,465	116,881	209,550	546,589
Holsington city.....	631	582	.....	.....	.....	.....	.....
Homestead twp.....	526	455	1,035	99,534	22,381	21,611	214,358
Clafin city.....	.....	214	626	53,005	11,962	4,869	15,918
Independent twp.....	623	412	.....	.....	.....	.....	.....
Ellinwood city.....	724	743	1,637	119,925	53,241	47,450	173,345
Lakin twp.....	912	894	.....	.....	.....	.....	.....
Liberty twp.....	398	398	54,142	7,024	.....	80,254	141,420
Logan twp.....	521	492	59,840	4,866	.....	26,005	90,711
Pawnee Rock city.....	204	170	60,730	20,050	9,941	39,008	129,729
Pawnee Rock twp.....	410	392	.....	.....	.....	.....	.....
South Bend twp.....	383	370	58,810	6,707	.....	.....	65,517
Union twp.....	241	230	46,378	5,504	.....	.....	51,882
Wheatland twp.....	354	327	47,192	2,741	.....	.....	49,936
Walnut twp.....	424	518	57,190	8,441	3,535	52,099	121,265

FARM AND CROP STATISTICS.—BARTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	191,906	182,310	\$72,924 00	186,807	418,444	\$167,377 30
Spring wheat.....bu.	398	477	190 80	209	.....	.....
Corn.....bu.	56,916	284,580	85,374 00	49,338	493,380	197,352 00
Oats.....bu.	10,982	43,928	13,178 40	4,971	7,205	2,521 75
Rye.....bu.	3,478	13,912	4,869 20	1,900	5,700	2,280 00
Barley.....bu.	5,436	.....	.....	2,111	8,444	3,377 60
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	953	47,650	39,549 50	893	44,650	40,185 00
Sweet potatoes.....bu.	9	297	297 00	5	250	250 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	1,487	.....	19,324 00	2,404	.....	18,030 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	50	25,000	750 00	16	.....	.....
Millet and hungarian, tons	2,111	3,694	18,470 00	2,971	4,457	22,285 00
Milo maize.....tons	95	380	1,330 00	144	2,880	1,296 00
Kaffir corn.....tons	243	729	2,551 00	1,671	33,420	16,710 00
Jerusalem corn.....tons	5	10	30 00	17	340	170 00
Timothy.....tons	.....	.....	.....	6	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	1	.....	.....	.....	.....	.....
Alfalfa.....tons	754	* 1,798	10,788 00	975	† 4,000	24,000 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	34,344	17,228	77,526 00	54,138	11,536	46,144 00
Totals.....	309,208	.....	\$347,151 90	308,576	.....	\$541,978 95

Wheat on hand March 1, 1893, 693,228 bushels; March 1, 1894, 197,843 bushels.

Corn on hand March 1, 1893, 392,531 bushels; March 1, 1894, 68,745 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

A good quality of magnesian limestone is quarried in the northern portion of the county, and sandstone of an inferior quality in the southern. Fire clay is found in the northern half of the county, and $3\frac{1}{2}$ miles north of Great Bend it has been found in veins of from 15 to 18 feet thick.

Salt marshes and springs are met with in the central portion, and salt beds south of the center and north of the Arkansas river. Three and one-half miles northeast of the city of Great Bend there is a flowing well of salt water, and a bed of rock salt of excellent quality has been drilled to the depth of 100 feet. The Arkansas river traverses the southern portion of the county. There are several minor streams of but little importance. Springs are not abundant, although well water is easily obtained at a depth of 10 feet on the bottoms.

SUMMARY.—BARTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	309,208	\$347,151 90	308,576	\$541,978 95
Animals slaughtered and sold for slaughter.....		169,318 00		148,630 00
Milk sold.....		6,084 00		2,030 00
Poultry and eggs sold.....		50,327 00		47,305 00
Wool clip.....lbs.	700	112 00	5,628	731 64
Cheese.....lbs.	965	106 15	2,330	279 60
Butter.....lbs.	222,101	35,536 16	220,955	35,352 80
Garden products marketed.....		6,718 00		5,619 00
Horticultural products.....		1,695 00		165 00
Honey and beeswax.....lbs.	1,000	180 00	200	36 00
Wine manufactured.....gals.	923	923 00	156	156 00
Wood marketed.....		57 00		123 00
Totals.....		\$618,208 21		\$782,406 99

LIVE STOCK.—BARTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,261	\$533,572 00	10,159	\$335,247 00
Mules and asses.....	1,249	77,438 00	1,173	49,266 00
Milch cows.....	6,305	126,100 00	5,430	119,460 00
Other cattle.....	11,143	189,431 00	8,008	144,144 00
Sheep.....	901	2,252 50	722	1,805 00
Swine.....	6,640	49,800 00	7,367	51,569 00
Totals.....	36,499	\$978,593 50	32,859	\$701,491 00

Number of dogs in county March 1, 1893, 2,147; March 1, 1894, 2,125.

Number of sheep killed by wolves, year ending March 1, 1894, 10.

BOURBON COUNTY.

It was organized in 1855. It has an area of 637 square miles, and ranks in population as the 13th county in the state. Fort Scott, situated in the east-central portion, is the county seat, and is the center of a large railroad system. A large sorghum sugar factory is being operated successfully at this place; cost of plant, \$75,000. A factory, which makes large quantities of excellent wrapping paper from

the sorghum bagasse, is also operated in connection with the sugar works. It is an important trading and manufacturing point, and commands an extensive trade for many miles south and west.

POPULATION AND VALUATION.—BOURBON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	25,372	25,090	\$2,349,874	\$861,348	\$1,605,914	\$1,073,607	\$5,890,743
Drywood twp.....	1,372	1,407	\$174,741	\$26,476	\$9,111	\$145,146	\$355,474
Franklin twp.....	1,170	1,186	219,756	38,855	1,845	.....	260,456
Fulton city.....	407	412	1,249	167,668	49,170	28,595	48,820
Freedom twp.....	771	837					
Bronson city.....	315	314	2,247	314,772	98,910	44,925	78,744
Uniontown.....	221	241					
Marion twp.....	1,721	1,692	203,533	29,100	8,344	124,160	370,137
Marmaton twp.....	1,298	1,266					
Mill Creek twp.....	1,118	1,016	197,920	26,852	3,237	33,266	261,275
Osage twp.....	1,194	1,118	195,635	39,385	1,174	80,922	317,116
Pawnee twp.....	996	968	145,098	20,126	11,558	103,373	283,155
Scott twp.....	2,163	2,106	421,432	61,545	7,060	290,861	783,898
Timberhill twp.....	984	962	113,418	18,500	10,130	25,542	167,590
Walnut twp.....	812	825	190,901	31,479	.....	30,686	253,066
Port Scott city:							
1st ward.....		1,437	.....	420,950	1,479,935	112,087	2,012,972
2d ward.....		2,305					
3d ward.....	10,830	2,514					
4th ward.....		2,059					
5th ward.....		2,425					

FARM AND CROP STATISTICS.—BOURBON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	15,904	240,618	\$110,684 28	9,871	145,979	\$58,391 60
Spring wheat.....bu.	30			42		
Corn.....bu.	71,186	1,779,650	533,895 00	72,201	1,444,020	505,407 00
Oats.....bu.	26,427	739,956	170,189 88	22,343	359,720	89,930 00
Rye.....bu.	303	4,545	2,045 25	328	4,920	1,968 00
Barley.....bu.	10			14	140	56 00
Buckwheat.....bu.	19	152	114 00	10	80	48 00
Irish potatoes.....bu.	895	80,550	48,330 00	1,088	87,040	43,520 00
Sweet potatoes.....bu.	14	1,400	1,400 00	17	1,530	1,530 00
Castor beans.....bu.	573	2,865	3,294 75	462	3,696	3,696 00
Sorghum.....bu.	1,824		69,740 00	2,690		98,185 00
Flax.....bu.	6,144	49,152	41,779 20	6,539	52,312	52,312 00
Tobacco.....lbs.	5			3	1,800	180 00
Broom corn.....lbs.	165	66,000	1,650 00	156		
Millet and hungarian.....tons	3,032	5,306	26,530 00	2,523	3,784	15,136 00
Milo maize.....tons	45	† 180	630 00			
Kafir corn.....tons	6	† 24	84 00	10	200	100 00
Jerusalem corn.....tons	6	† 18	54 00			
Timothy.....tons	22,248			22,593		
Clover.....tons	1,546			799		
Blue grass.....tons	277	* 15,739	94,434 00	107	† 16,502	99,012 00
Alfalfa.....tons	7			2		
Orchard grass.....tons	86			60		
Other tame grasses.....tons	1,207			448		
Prairie grass, fenced.....tons	51,871	22,155	72,003 75	37,013	20,760	62,280 60
Totals.....	203,830		\$1,176,858 11	179,319		\$1,031,751 00

Wheat on hand March 1, 1893, 5,782 bushels; March 1, 1894, 17,203 bushels.

Corn on hand March 1, 1893, 175,737 bushels; March 1, 1894, 244,895 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Bourbon county is well supplied with railroads operated by the Missouri Pacific, Missouri, Kansas & Texas and Kansas City, Fort Scott & Memphis companies.

Timber belts average one-half mile in width, and contain all the principal native varieties found in Kansas. The general surface of the county is gently undulating. Bottom lands comprise about 30 per cent. of the county area, and average, on the rivers and larger creeks, one mile in width. There are numerous streams and springs in all portions of the county. The Little Osage and Marmaton rivers are the principal streams.

A good quality of limestone is found in all parts of the county. An excellent quality of sandstone, adapted to paving, is found in several localities, fine quarries having been opened at Redfield, Gilfillan, and west of Hiattville. Mineral paint, cement and fire clay are abundant in the vicinity of Fort Scott, and are manufactured in the last-named city to a considerable extent. Fire clay is also found near the towns of Fulton and Mapleton.

SUMMARY.—BOURBON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	203,830	\$1,176,858 11	179,319	\$1,031,751 60
Animals slaughtered and sold for slaughter.....		1,083,750 00		388,051 00
Milk sold.....		29,790 00		23,345 00
Poultry and eggs sold.....		38,066 00		36,528 00
Wool clip.....lbs.	2,350	376 00	515	66 95
Cheese.....lbs.	3,000	330 00		
Butter.....lbs.	445,099	71,215 84	401,743	64,278 88
Garden products marketed.....		8,138 00		10,896 00
Horticultural products.....		4,755 00		1,193 00
Honey and beeswax.....lbs.	14,653	2,648 74	6,431	1,159 32
Wine manufactured.....gals.	395	395 00	182	182 00
Wood marketed.....		1,087 00		9,119 00
Total.....		\$2,417,409 69		\$1,566,570 75

LIVE STOCK.—BOURBON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,760	\$611,520 00	11,136	\$367,290 00
Mules and asses.....	1,506	93,372 00	1,384	58,128 00
Milch cows.....	7,373	147,460 00	7,024	154,528 00
Other cattle.....	14,779	251,243 00	13,307	239,526 00
Sheep.....	480	1,200 00	272	680 00
Swine.....	13,698	102,735 00	18,973	132,811 00
Totals.....	49,596	\$1,207,530 00	52,096	\$952,963 00

Number of dogs in county March 1, 1893, 2,532; March 1, 1894, 2,673.

Number of sheep killed by dogs, year ending March 1, 1894, 5.

Number of sheep killed by wolves, year ending March 1, 1894, 4.

BROWN COUNTY.

Organized as a county under the territorial government, in 1855; has an area of 576 square miles, and ranks as the 24th county in point of population. Hiawatha, situated a little north of the center, is the county seat. Horton, situated near the

POPULATION AND VALUATION.—BROWN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	19,828	19,416	\$2,677,065	\$908,009	\$745,070	\$776,957	\$5,107,101
Hamlin twp.....	1,091	1,150	\$213,420	\$59,530	\$20,635	\$53,920	\$347,505
Hiawatha city.....	2,601	2,497	406,915	206,388	291,355	136,556	1,041,214
Hiawatha twp.....	1,607	1,707	208,130	47,200	.....	.....	255,330
Irving twp.....	787	680	.....	.....	.....	.....	.....
Baker city.....	138	141	.....	.....	.....	.....	.....
Willis city.....	131	139	.....	.....	.....	.....	.....
Horton city.....	4,086	3,447	455,350	153,745	350,053	239,427	1,198,575
Mission twp.....	1,863	1,997	.....	.....	.....	.....	.....
Morrill city.....	288	332	206,620	73,380	16,150	52,969	349,119
Morrill twp.....	1,010	1,030	171,890	52,085	2,540	41,116	267,631
Padonia twp.....	684	844	275,235	89,540	6,108	44,868	415,751
Powhattan twp.....	1,347	1,218	215,010	54,470	14,735	48,707	332,922
Robinson twp.....	1,244	1,267	301,890	98,450	21,679	62,028	484,047
Walnut twp.....	1,620	1,628	222,605	73,221	21,815	97,366	415,007
Everest city.....	463	458	.....	.....	.....	.....	.....
Washington twp.....	868	881	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—BROWN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	46,364	58,415	\$29,207 50	33,697	858,598	\$360,611 16
Spring wheat.....bu.	1,595	7,656	3,215 52	109	2,295	872 10
Corn.....bu.	132,964	5,983,380	1,675,346 40	129,841	2,337,138	794,626 92
Oats.....bu.	29,935	718,440	150,872 40	23,176	405,575	105,449 50
Rye.....bu.	604	9,664	3,652 32	1,562	29,678	10,684 08
Barley.....bu.	684	17,100	6,156 00	427	6,405	2,562 00
Buckwheat.....bu.	26	208	156 00	41	328	196 80
Irish potatoes.....bu.	1,083	72,561	52,243 92	1,268	53,256	30,355 92
Sweet potatoes.....bu.	5	365	365 00	2	250	200 00
Castor beans.....bu.	.....	.....	.....	50	500	500 00
Sorghum.....bu.	27	.....	728 00	66	.....	957 00
Flax.....bu.	540	5,400	4,590 00	180	1,440	1,440 00
Tobacco.....lbs.	.....	.....	.....	5	3,000	300 00
Broom corn.....lbs.	25	12,500	375 00	10	.....	.....
Millet and hungarian, tons	1,448	3,620	14,480 00	1,448	1,448	7,240 00
Milo maize.....tons	.....	.....	.....	.....	.....	.....
Kaffir corn.....tons	.....	.....	.....	19	475	237 50
Jerusalem corn.....tons	.....	.....	.....	.....	.....	.....
Timothy.....tons	36,469	.....	.....	30,879	.....	.....
Clover.....tons	3,538	.....	.....	4,451	.....	.....
Blue grass.....tons	3,728	* 23,887	143,322 00	4,164	† 18,393	110,358 00
Alfalfa.....tons	33	.....	.....	29	.....	.....
Orchard grass.....tons	49	.....	.....	79	.....	.....
Other tame grasses.....tons	1,566	.....	.....	1,903	.....	.....
Prairie grass, fenced.....tons	17,556	5,863	32,246 50	11,989	6,197	37,182 00
Totals.....	278,239	.....	\$2,116,956 56	245,395	.....	\$1,463,772 98

Wheat on hand March 1, 1893, 184,754 bushels; March 1, 1894, 108,397 bushels.

Corn on hand March 1, 1893, 1,244,920 bushels; March 1, 1894, 2,036,572 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

southern border, a little east of the center, is a thriving place, having a large trade with the surrounding country. Everest, Robinson, Morrill, Willis, Hamlin, Reserve and Fairview are important points in their respective localities.

The railroads in the county are: The Missouri Pacific; St. Joseph and Grand Island, operated by the Union Pacific; and the Chicago, Rock Island & Pacific.

Creek bottoms average one-half mile in width. The south and east sides of creeks are generally bluff; the north and west sides nearly always a gentle slope. The streams are all fringed with a growth of timber; the principal varieties found are bur oak, black walnut, hickory, honey locust, hackberry, sycamore, white and red elm, box elder, basswood, and black oak. Springs are numerous in all portions of the county, and well water is found at an average depth of 30 feet.

Limestone suitable for building purposes is abundant in all portions of the county; the best quarries are upon Walnut creek, four miles northwest of Hiawatha. A good quality of sandstone is also found in the same vicinity. Coal is mined to a very limited extent in Robinson and Washington townships, the veins being thin and unprofitable.

SUMMARY.—BROWN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	278,239	\$2,116,956 56	245,395	\$1,463,772 98
Animals slaughtered and sold for slaughter.....		935,716 00		770,980 00
Milk sold.....		3,917 00		1,738 00
Poultry and eggs sold.....		39,225 00		44,281 00
Wool clip.....lbs.	3,599	575 84	4,148	539 24
Cheese.....lbs.	1,090	119 90	1,630	195 60
Butter.....lbs.	372,882	59,661 12	394,609	63,137 44
Garden products marketed.....		6,113 00		6,865 00
Horticultural products.....		2,597 00		5,158 00
Honey and beeswax.....lbs.	18,081	3,261 93	14,392	2,593 56
Wine manufactured.....gals.	3,507	3,507 00	3,832	3,832 00
Wood marketed.....		5,488 00		3,655 00
Totals.....		\$3,177,138 35		\$2,366,747 82

LIVE STOCK.—BROWN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	13,320	\$692,640 00	13,323	\$439,659 00
Mules and asses.....	1,382	85,684 00	1,576	66,192 00
Milch cows.....	7,696	153,920 00	7,419	163,218 00
Other cattle.....	16,636	282,812 00	15,138	272,484 00
Sheep.....	575	1,437 50	1,400	3,500 00
Swine.....	28,484	213,630 00	34,249	239,743 00
Totals.....	68,093	\$1,430,123 50	73,105	\$1,184,796 00

Number of dogs in county March 1, 1893, 1,664; March 1, 1894, 1,634.

Number of sheep killed by dogs, year ending March 1, 1894, 10.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

BUTLER COUNTY.

Is in the south-central part of the state; was organized in 1855; has an area of 1,428 square miles, and is the largest county in the state, (its territory being larger than that of the state of Rhode Island,) and ranks as the 20th county in population. El Dorado, situated a little north of the center, is the county seat. The cities of Augusta and Douglass, in the southwestern portion, are places of much importance. Leon, Latham, Brainerd, White Water, Rosalia and Towanda are also flourishing places.

The railroads of the county are: The Chicago, Kansas & Nebraska, operated by the Chicago, Rock Island & Pacific; Fort Scott, Wichita & Western, as part of the Missouri Pacific system; the Florence, El Dorado & Walnut Valley, Chicago, Kansas & Western, and St. Louis & San Francisco, all operated by the Atchison, Topeka & Santa Fé, the latter, however, as an independent line.

The surface of the western part of the county is principally bottom land and gently rolling prairies, while the eastern portion is in many places broken and rough. River and creek bottoms, in the aggregate, make 15 per cent. of the total area, and average from one to two miles in width. Timber belts average along the streams from one-fourth to three-fourths of a mile in width. In these belts are found the

POPULATION AND VALUATION.—BUTLER COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	22,565	21,126	\$2,878,109	\$499,875	\$609,068	\$1,101,175	\$5,088,218
Augusta city.....	812	1,026					
Augusta twp.....	672	594	\$109,165	\$46,072	\$95,891	\$93,176	\$344,305
Benton twp.....	782	672	95,374	10,491	6,282	33,110	151,257
Bloomington twp.....	519	472	80,731	10,153			90,884
Bruno twp.....	760	675	92,187	15,803	5,185	51,873	165,048
Chelsea twp.....	606	606	141,025	21,848	376		163,249
Clay twp.....	312	314	60,908	5,399			66,307
Clifford twp.....	521	461	99,564	9,099			108,663
Douglass city.....	694	674					
Douglass twp.....	492	436	118,416	35,635	52,263	39,956	246,270
El Dorado city.....	3,861	3,427	175,514	103,014	387,024	138,022	803,574
El Dorado twp.....	686	555					
Fairmount twp.....	624	595	93,526	18,834	1,725	37,955	152,040
Fairview twp.....	429	403	79,345	9,865		9,808	99,018
Glencoe twp.....	763	678	84,445	8,963	4,614	88,309	186,331
Hickory twp.....	388	486	72,902	5,967		52,479	131,348
Lincoln twp.....	412	314	162,845	20,978	1,163	81,896	266,882
Leon city.....	413	417					
Little Walnut twp.....	501	442	80,353	11,497	19,756	51,417	163,023
Logan twp.....	381	362	50,218	4,955			55,173
Brainerd city.....	140	81					
White Water city.....	223	216	99,106	26,885	13,366	48,364	187,721
Milton twp.....	521	565					
Murdock twp.....	627	591	90,375	13,110			103,485
Pleasant twp.....	602	599	93,995	9,691		28,412	132,098
Plum Grove twp.....	530	467	70,977	8,759	5,968	25,185	110,889
Prospect twp.....	768	700	183,386	23,668	545	44,526	252,125
Richland twp.....	706	555	99,172	12,600	2,079	8,058	121,909
Rock Creek twp.....	401	399	82,266	8,810			91,076
Rosalia twp.....	562	629	84,890	7,513	1,398	66,224	160,025
Spring twp.....	735	661	82,632	5,393		60,488	148,513
Sycamore twp.....	463	465	154,996	16,633	962		172,591
Towanda twp.....	596	597	70,677	10,298	4,712	44,229	129,916
Union twp.....	558	471	68,447	5,492	5,759	41,803	121,601
Walnut twp.....	505	531	100,662	12,450		49,885	162,997

following varieties: Oak, walnut, hickory, mulberry, sycamore, elm, hackberry, and pecan. Of the several streams in the county, the Walnut river is the principal.

Magnesian limestone is abundant in all parts; extensive quarries have been developed, and large quantities of this stone are shipped from El Dorado, Augusta, Douglass, Towanda, and Potwin. Small quantities of gypsum are found in the western townships. Salt water has been discovered at the city of El Dorado, at a depth of 750 feet; also at the town of Potwin, about 12 miles northwest, at a depth of 800 feet.

FARM AND CROP STATISTICS.—BUTLER COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	39,056	380,783	\$152,313 20	24,009	211,270	\$88,733 40
Spring wheat.....bu.	42			10		
Corn.....bu.	132,943	1,994,145	63,812 40	143,888	1,438,880	503,608 00
Oats.....bu.	54,355	1,250,165	287,537 95	50,970	639,160	166,181 60
Rye.....bu.	903	16,254	5,688 90	467	4,670	1,868 00
Barley.....bu.	57			30	240	96 00
Buckwheat.....bu.	57	342	256 50	15	120	72 00
Irish potatoes.....bu.	921	30,393	22,794 75	1,195	28,680	24,951 60
Sweet potatoes.....bu.	56	3,080	3,080 00	34	1,870	1,159 40
Castor beans.....bu.	26	104	119 60	20	160	160 00
Sorghum.....bu.	3,599		52,184 00	4,818		53,768 00
Flax.....bu.	6,252	50,016	42,513 60	7,151	42,906	42,906 00
Tobacco.....lbs.				1	600	60 00
Broom corn.....lbs.	179	71,600	2,148 00	207		
Millet and hungarian.....tons	8,754	17,508	87,540 00	12,365	21,638	64,914 00
Milo maize.....tons	60	† 240	840 00	74	1,110	499 50
Kafir corn.....tons	792	† 2,376	8,316 00	1,640	22,960	11,480 00
Jerusalem corn.....tons	81	† 162	486 00	41	615	307 50
Timothy.....tons	1,476		699			
Clover.....tons	574		205			
Blue grass.....tons	1,294	* 4,969	29,814 00	1,119	† 3,883	23,298 00
Alfalfa.....tons	1,586		2,610	†		
Orchard grass.....tons	167		58			
Other tame grasses.....tons	245		190			
Prairie grass, fenced.....tons	191,953	70,946	319,257 00	162,163	53,363	213,452 00
Totals.....	445,428		\$1,078,701 90	413,979		\$1,197,515 00

Wheat on hand March 1, 1893, 97,011 bushels; March 1, 1894, 67,764 bushels.

Corn on hand March 1, 1893, 577,370 bushels; March 1, 1894, 265,698 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—BUTLER COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	445,428	\$1,078,701 90	413,979	\$1,197,515 00
Animals slaughtered and sold for slaughter.....		1,085,375 00		1,143,302 00
Milk sold.....		5,116 00		6,428 00
Poultry and eggs sold.....		77,246 00		76,989 00
Wool clip.....lbs.	229,334	36,693 44	205,167	26,671 71
Cheese.....lbs.	4,740	521 40	1,380	165 60
Butter.....lbs.	585,305	93,648 80	560,406	89,664 96
Garden products marketed.....		5,469 00		12,590 00
Horticultural products.....		7,214 00		3,196 00
Honey and beeswax.....lbs.	9,693	1,757 06	1,492	271 92
Wine manufactured.....gals.	1,864	1,864 00	2,491	2,491 00
Wood marketed.....		2,583 00		3,281 00
Totals.....		\$2,396,189 60		\$2,562,566 19

LIVE STOCK.—BUTLER COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	17,049	\$886,548 00	17,039	\$562,287 00
Mules and asses.....	1,592	98,704 00	1,700	71,400 00
Milch cows.....	11,858	237,160 00	10,513	236,286 00
Other cattle.....	38,492	654,364 00	40,686	732,348 00
Sheep.....	37,294	93,235 00	28,330	70,825 00
Swine.....	31,290	234,675 00	37,307	261,149 00
Totals.....	137,575	\$2,204,686 00	135,575	\$1,934,295 00

Number of dogs in county March 1, 1893, 3,039; March 1, 1894, 2,641.

Number of sheep killed by dogs, year ending March 1, 1894, 16.

Number of sheep killed by wolves, year ending March 1, 1894, 159.

CHASE COUNTY.

Organized in 1859; has an area of 750 square miles, and ranks as the 70th county in the state in point of population. Cottonwood Falls, north and east of the center is the county seat. Strong City, across the Cottonwood river north from Cottonwood Falls, is a thriving town.

The main line of the Atchison, Topeka & Santa Fé railroad traverses the county from east to west. The Chicago, Kansas & Western, a branch of the same line crosses the northwestern part of the county.

The general surface of the north and central parts of the county shows gently rolling slopes, terminating in a few places along the streams in abrupt bluffs. The southern portion is broken and hilly. River bottoms average $2\frac{1}{2}$ miles in width, and those on the creeks three-fourths of a mile. The bottom lands comprise about 12 per cent. of the total area. Timber belts average three-eighths of a mile in width, and contain the following varieties: Walnut, bur oak, cottonwood, sycamore, ash, red and white elm, hackberry, box elder, redbud, buckeye, and red cedar on a few of the streams. Springs are found in all sections. The Cottonwood river, entering the western border three miles south of the center, and flowing in a northeasterly direction across the county, is the principal stream. It furnishes excellent water

POPULATION AND VALUATION.—CHASE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	7,322	6,789	\$1,676,638	\$468,892	\$166,034	\$517,649	\$2,829,213
Bazaar twp.....	607	524	\$218,176	\$36,055	\$385	\$10,867	\$265,483
Cedar twp.....	669	673	174,360	27,165	280	.....	201,805
Cottonwood twp.....	801	801	193,228	59,585	10,400	148,632	411,845
Diamond Creek twp.....	1,017	1,081	338,532	89,069	11,076	111,948	550,625
Cottonwood Falls city	795	606	284,627	168,469	131,063	162,774	746,933
Strong City.....	842	703					
Falls twp.....	991	838	242,050	28,625	7,319	.....	277,994
Matfield Green city.	158	159					
Matfield twp.....	555	561	225,665	59,924	5,511	83,428	374,528
Toledo twp.....	837	843					

power, which is utilized at Elmdale and Cedar Point by excellent roller-process flouring mills.

A fine quality of limestone is found in large quantities in all portions of the county, and along the line of the Atchison, Topeka & Santa Fé railroad large quarries are in operation, furnishing building stone to many sections of the state. The west wing and central portion of the capitol building, at Topeka, are built of this stone. Clay of good quality is found along the Cottonwood river, from which brick is being manufactured at Cottonwood Falls.

FARM AND CROP STATISTICS.—CHASE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	9,281	176,339	\$74,062 38	7,590	85,839	\$36,910 77
Spring wheat.....bu.	131			9		
Corn.....bu.	50,918	1,272,950	381,885 00	45,622	456,220	173,363 60
Oats.....bu.	9,393	281,790	67,629 60	8,469	181,148	54,344 40
Rye.....bu.	263	3,945	1,775 25	343	3,430	1,440 60
Barley.....bu.				220	3,300	1,320 00
Buckwheat.....bu.				20	160	96 00
Irish potatoes.....bu.	499	13,972	9,780 40	603	33,165	27,195 30
Sweet potatoes.....bu.	11	880	880 00	23	920	800 40
Castor beans.....bu.						
Sorghum.....bu.	1,003		18,349 00	1,927		16,642 00
Flax.....bu.	413	2,065	1,755 25	790	7,110	7,110 00
Tobacco.....lbs.						
Broom corn.....lbs.	12	6,000	180 00	33		
Millet and hungarian.....tons	3,721	4,651	18,604 00	4,764	9,528	38,112 00
Milo maize.....tons	2	†	21 00	38	760	342 00
Kafir corn.....tons	291	†	4,074 00	653	13,060	6,530 00
Jerusalem corn.....tons						
Timothy.....tons	119			86		
Clover.....tons	257			101		
Blue grass.....tons	227	* 6,157	36,942 00	162	† 9,186	55,116 00
Alfalfa.....tons	2,290			2,688		
Orchard grass.....tons	42			86		
Other tame grasses.....tons	38			40		
Prairie grass, fenced.....tons	54,276	25,092	100,368 00	88,011	22,500	90,000 00
Totals.....	133,187		\$716,305 88	162,278		\$509,323 07

Wheat on hand March 1, 1893, 17,231 bushels; March 1, 1894, 24,907 bushels.

Corn on hand March 1, 1893, 186,040 bushels; March 1, 1894, 111,700 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CHASE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	133,187	\$716,305 88	162,278	\$509,323 07
Animals slaughtered and sold for slaughter.....		867,358 00		798,017 00
Milk sold.....		276 00		366 00
Poultry and eggs sold.....		12,487 00		17,730 00
Wool clip.....lbs.	2,625	420 00	2,500	325 00
Cheese.....lbs.			200	24 00
Butter.....lbs.	224,218	35,874 88	164,448	26,311 68
Garden products marketed.....		4,336 00		3,800 00
Horticultural products.....		952 00		379 00
Honey and beeswax.....lbs.	3,281	592 26	3,214	579 12
Wine manufactured.....gals.	826	826 00	1,439	1,439 00
Wood marketed.....		1,255 00		697 00
Totals.....		\$1,640,683 02		\$1,358,990 89

LIVE STOCK.—CHASE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	6,732	\$350,064 00	6,087	\$200,871 00
Mules and asses.....	592	36,704 00	558	23,436 00
Milch cows.....	1,929	38,580 00	2,497	54,934 00
Other cattle.....	26,920	457,640 00	23,454	422,172 00
Sheep.....	346	865 00	299	747 50
Swine.....	10,544	79,080 00	12,302	86,114 00
Totals.....	47,063	\$962,933 00	45,197	\$788,274 50

Number of dogs in county March 1, 1893, 1,126; March 1, 1894, 908.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 2.

CHAUTAUQUA COUNTY.

It has an area of 651 square miles; ranks as the 55th county in population. Howard county was organized in 1870; but in 1875 the legislature of the state divided the county from east to west in the center, giving the name of Elk to the northern half and of Chautauqua to the southern half. Sedan, a little east and south of the center, is the county seat. Cedar Vale, in the western portion, on Big Caney creek, is a place of considerable importance. The town of Elgin, near the southern border, is an important shipping point for cattle from the Indian Territory. It is also an important commercial point, having a large trade with the various Indian agencies in the Indian Territory.

The railroads in the county are: The Denver, Memphis & Atlantic, Le Roy & Caney Valley, both of which are operated as a part of the Missouri Pacific system; and the Chicago, Kansas & Western, as a part of the Atchison, Topeka & Santa Fé system.

POPULATION AND VALUATION.—CHAUTAUQUA COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	10,614	10,568	\$1,122,853	\$337,368	\$160,051	\$446,819	\$2,067,092
Chautauqua city.....	240 } 1,356	249 } 1,398	\$96,647	\$26,431	\$16,156	.....	\$139,234
Belleville twp.....	1,116 }	1,149 }	822	117,284	32,135	727	\$82,441
Caneyville twp.....	891	822	92,430	26,447	.....	.....	118,877
Center twp.....	544	544	126,200	34,899	999	80,593	242,691
Harrison twp.....	737	678	71,080	26,740	6,895	48,815	153,530
Hendricks twp.....	799	806	114,980	48,004	39,840	18,606	221,430
Cedar Vale city.....	566 } 1,363	583 } 1,464	14,145	.....	.....	.....	90,615
Jefferson twp.....	797 }	881 }	76,470	22,074	2,174	60,027	157,826
Lafayette twp.....	573	514	73,551	13,995	.....	37,892	139,417
Little Caney twp.....	749	681	87,530	61,807	92,705	34,584	282,836
Salt Creek twp.....	560	565	94,740	20,950	165	48,476	166,702
Sedan city.....	1,058 } 1,611	1,119 } 1,673	97,111	9,741	390	35,385	120,346
Sedan twp.....	553 }	554 }	74,830	.....	.....	.....	.....
Summit twp.....	779	726	.....	.....	.....	.....	.....
Washington twp.....	652	697	.....	.....	.....	.....	.....

The surface in the southern portion is gently undulating, and along some of the creeks it is broken and irregular. The northwestern part is very level, and has but a small per cent. of territory unfit for agriculture. Bottom lands on the larger creeks average one mile in width, and on the smaller streams from one-fourth to one-half mile. There are belts of timber along all the streams, while some of the uplands have beautiful natural groves. All varieties of trees native to Kansas are met with in this county. Springs are abundant in all sections, and well water is found at a depth of from 15 to 20 feet. The county is well supplied with streams, the watershed bearing to the southeast.

FARM AND CROP STATISTICS.—CHAUTAUQUA COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	24,720	300,592	\$135,266 40	17,453	308,389	\$117,187 82
Spring wheat.....bu.	65			15		
Corn.....bu.	45,964	689,460	234,416 40	50,583	758,745	288,323 10
Oats.....bu.	11,653	314,631	66,072 51	13,037	271,154	67,788 50
Rye.....bu.	94	1,880	827 20	75	1,125	506 25
Barley.....bu.	10					
Buckwheat.....bu.	16	128	96 00			
Irish potatoes.....bu.	347	27,760	24,984 00	399	19,950	13,366 50
Sweet potatoes.....bu.	35	3,850	3,850 00	44	2,728	2,591 60
Castor beans.....bu.	481	2,886	3,318 90	420	3,360	3,360 00
Sorghum.....bu.	822		14,486 00	810		3,702 00
Cotton.....lbs.	43	17,200	1,204 00	4	800	48 00
Flax.....bu.	2,012	12,072	10,261 20	4,131	24,786	24,786 00
Tobacco.....lbs.	73			1	600	60 00
Broom corn.....lbs.	26	13,000	390 00	38		
Millet and hungarian, tons	3,224	5,642	16,926 00	3,264	5,712	17,136 00
Milo maize.....tons	28	† 84	294 00	62	1,240	558 00
Kafir corn.....tons	238	† 714	2,499 00	383	9,575	4,787 50
Jerusalem corn.....tons	28	† 56	168 00	6	120	60 00
Timothy.....tons	247	* 3,102	18,612 00	255	† 2,018	12,108 00
Clover.....tons	223			24		
Blue grass.....tons	87			124		
Alfalfa.....tons	1,029			1,747		
Orchard grass.....tons	47	* 3,102	18,612 00	5	† 2,018	12,108 00
Other tame grasses.....tons	106			180		
Prairie grass, fenced.....tons	31 570	15,407	38,517 50	48,837	14,016	42,048 00
Totals.....	123,188		\$572,189 11	141,897		\$598,417 27

Wheat on hand March 1, 1893, 13,864 bushels; March 1, 1894, 37,773 bushels.

Corn on hand March 1, 1893, 106,122 bushels; March 1, 1894, 73,381 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CHAUTAUQUA COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	123,188	\$572,189 11	141,897	\$598,417 27
Animals slaughtered and sold for slaughter.....		289,930 00		323,387 00
Milk sold.....		10 00		
Poultry and eggs sold.....		22,510 00		21,991 00
Wool clip.....lbs.	200	32 00	255	33 15
Cheese.....lbs.	125	13 75		
Butter.....lbs.	256,313	41,010 08	272,436	43,589 76
Garden products marketed.....		3,787 00		3,479 00
Horticultural products.....		3,951 00		12,790 00
Honey and beeswax.....lbs.	5,576	1,009 35	1,863	336 62
Wine manufactured.....gals.	769	769 00	449	449 00
Wood marketed.....		1,340 00		1,115 00
Totals.....		\$936,551 29		\$1,005,587 80

LIVE STOCK.—CHAUTAUQUA COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	7,866	\$409,032 00	7,472	\$246,576 00
Mules and asses.....	1,221	75,702 00	1,347	56,574 00
Milch cows.....	5,759	115,180 00	5,291	116,402 00
Other cattle.....	14,317	243,389 00	13,956	251,208 00
Sheep.....	52	130 00	28	70 00
Swine.....	9,252	69,390 00	12,065	84,455 00
Totals.....	38,467	\$912,823 00	40,159	\$755,285 00

Number of dogs in county March 1, 1893, 2,024; March 1, 1894, 1,840.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

CHEROKEE COUNTY.

Was organized in 1866; has an area of 589 square miles, and is the eighth county in point of population. Columbus, nearly in the center of the county, is the county seat. Weir, Galena, and Baxter Springs, situated in the southeastern portion of the county, and Scammon, in the northeastern portion, are important and thriving places. There are several other small towns, each having considerable local trade.

The railroads in the county are: The Nevada & Minden, operated by the Missouri Pacific; Kansas City, Fort Scott & Memphis; and St. Louis & San Francisco.

The general surface is undulating, being considerably cut up with shallow draws, and some high swells or mounds. The bottoms along the streams have an average width of from one-half to one mile, and in the aggregate make 20 per cent. of the county area. Heavy belts of timber, of from one-half to three-fourths of a mile in width, occur on the Neosho and Spring rivers, and Cherry creek. On the other

POPULATION AND VALUATION.—CHEROKEE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	28,309	26,507	\$2,009,156	\$402,660	\$679,776	\$791,575	\$3,883,175
Cherokee twp.....	937	1,368	\$101,424	\$7,549	\$4,068	\$61,183	\$174,232
Crawford twp.....	827	838	121,095	6,045	.....	71,845	198,985
Garden twp.....	1,293	1,339	110,445	8,504	3,230	17,754	139,933
Lola twp.....	1,404	1,101	130,834	9,986	5,973	92,375	239,168
Galena city.....	3,028	2,782	99,190	96,758	159,026	56,693	411,667
Empire city.....	806	806					
Lowell twp.....	1,861	1,861					
Lyon twp.....	982	967					
Weir city.....	3,038	2,738	151,375	17,840	.....	.....	169,215
Mineral twp.....	2,733	5,771	134,670	63,047	182,909	124,798	505,424
Neosho twp.....	1,107	1,001	171,966	10,923	2,975	40,188	226,052
Pleasant View twp..	1,030	939	160,864	20,334	.....	16,489	197,687
Ross twp.....	1,149	1,110	190,938	19,302	.....	53,654	263,894
Columbus city.....	2,201	2,154	128,870	59,425	196,560	88,730	473,585
Salamanca twp.....	878	903					
Shawnee twp.....	934	957	115,360	18,154	4,039	46,212	183,765
Sheridan twp.....	1,366	1,359	230,465	14,135	641	.....	245,241
Baxter Springs city..	1,256	1,366	161,600	50,658	120,355	121,654	454,327
Spring Valley twp...	1,479	1,232					

streams of the county the belts vary from one-fourth to one-half mile. The varieties of native timber found on the streams are: Oak, hickory, hackberry, walnut, sycamore, hard and soft maple, honey locust, pecan, coffee bean, cottonwood, mulberry, birch, and, in a few localities, ash and willow.

Limestone crops out in most of the deep draws and along the streams. Sandstone is found west of Spring river, near the top of high ridges. Fire clay is abundant adjoining the coal seams, and potters' clay is plentifully found in many places between the limestone and sandstone, entering largely into the manufacturing of brick and retorts used in zinc smelters. A fine quality of coal underlies nearly all

FARM AND CROP STATISTICS.—CHEROKEE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	47,117	508,860	\$228,987 00	44,398	786,560	\$346,086 40
Spring wheat.....bu.	7					
Corn.....bu.	55,752	1,115,040	356,812 80	57,871	1,446,775	593,177 75
Oats.....bu.	25,398	558,756	139,689 00	26,422	554,850	149,809 50
Rye.....bu.	87	1,044	574 20	19	190	76 00
Buckwheat.....bu.	31	248	186 00	38	304	182 40
Irish potatoes.....bu.	792	47,520	37,065 60	903	67,725	28,444 50
Sweet potatoes.....bu.	181	14,118	14,118 00	179	24,165	10,149 30
Castor beans.....bu.	240	1,920	2,208 00	171	1,368	1,368 00
Sorghum.....bu.	361		8,305 00	894		10,390 20
Cotton.....lbs.	64					
Flax.....bu.	2,593	12,965	11,020 25	2,961	23,688	23,688 00
Tobacco.....lbs.	1			2	1,200	120 00
Broom corn.....lbs.	80	32,000	960 00	44		
Millet and hungarian, tons	943	1,414	5,656 00	489	734	2,936 00
Milo maize.....tons		†		3	60	27 00
Kaffir corn.....tons	10	‡	105 00	61	1,220	610 00
Jerusalem corn.....tons	10	‡	60 00	3	60	30 00
Timothy.....tons	10,817			11,395		
Clover.....tons	277			84		
Blue grass.....tons	515			531		
Alfalfa.....tons	73	* 8,949	53,694 00	3	† 7,091	42,546 00
Orchard grass.....tons	25			10		
Other tame grasses.....tons	5,766			4,284		
Prairie grass, fenced.....tons	34,737	26,118	104,472 00	31,444	17,588	87,940 00
Totals.....	185,877		\$963,912 85	179,209		\$1,297,581 05

Wheat on hand March 1, 1893, 33,010 bushels; March 1, 1894, 39,165 bushels.

Corn on hand March 1, 1893, 116,734 bushels; March 1, 1894, 102,054 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CHEROKEE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	185,877	\$963,912 85	179,209	\$1,297,581 05
Animals slaughtered and sold for slaughter.....		161,346 00		152,873 00
Milk sold.....		13,318 00		2,693 00
Poultry and eggs sold.....		23,801 00		74,303 00
Wool clip.....lbs.	29,963	4,794 08	4,172	542 36
Cheese.....lbs.	5,300	583 00	4,510	541 20
Butter.....lbs.	361,969	57,915 04	369,807	59,169 12
Garden products marketed.....		18,497 00		20,429 00
Horticultural products.....		10,124 00		3,004 00
Honey and beeswax.....lbs.	17,191	3,101 45	4,131	743 36
Wine manufactured.....gals.	228	228 00	27	27 00
Wood marketed.....		646 00		1,861 00
Total.....		\$1,258,266 42		\$1,613,767 69

portions of the county. It is extensively mined, and, after supplying the local demand, is shipped to all portions of the state. Lead and zinc mines have been established in the southeastern portion, on Short creek, and the product has a reputation in the commercial world second to none. Large numbers of people are employed in the mines and smelters, and a vast sum of money is annually distributed among the employes. Bitumen and petroleum are found on Tar creek in small quantities.

LIVE STOCK.—CHEROKEE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	9,941	\$516,932 00	8,568	\$282,744 00
Mules and asses	1,480	91,760 00	1,302	54,684 00
Milch cows	7,182	143,640 00	5,576	122,672 00
Other cattle	10,273	174,641 00	7,621	137,178 00
Sheep	748	1,870 00	749	1,872 50
Swine	8,935	67,012 50	9,144	64,008 00
Totals	38,559	\$995,855 50	32,960	\$663,158 50

Number of dogs in county March 1, 1893, 2,186; March 1, 1894, 2,008.

Number of sheep killed by dogs, year ending March 1, 1894, 41.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

CHEYENNE COUNTY.

Organized in 1886; has an area of 1,020 square miles, and ranks as the 77th county in population in the state. St. Francis, a little east of the center, is the county seat.

The Beaver Valley railroad, a branch of the Burlington & Missouri River, enters the county on the east, and terminates at the town of St. Francis.

POPULATION AND VALUATION.—CHEYENNE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	4,868	5,044	\$998,520	\$101,700	\$80,736	\$109,832	\$1,290,788
Alexander twp.	151	161	\$49,900	\$1,510	.....	.....	\$51,410
Beaver twp.	355	335	130,270	5,050	.....	.....	135,320
Bankelman twp.	492	525	53,390	6,390	.....	.....	59,780
Bird City	177 } 320	153 } 308	52,400	10,170	\$30,550	\$34,818	127,938
Bird City twp.	143 }	155 }	.....	.....	.....	.....	.....
Calhoun twp.	260	293	56,680	3,380	.....	.....	60,060
Cherry Creek twp.	281	284	54,970	1,920	.....	.....	56,890
Cleveland Run twp.	367	351	54,210	4,810	.....	.....	59,020
Dent twp.	320	297	81,770	2,040	.....	.....	83,810
Enreka twp.	350	379	49,970	1,720	.....	.....	51,690
Evergreen twp.	172	165	29,370	1,430	.....	.....	30,800
Jaqua twp.	205	241	44,440	4,210	960	.....	49,610
Jefferson twp.	141	122	49,300	1,410	.....	26,324	77,034
Lawn Ridge twp.	227	275	78,010	1,970	.....	.....	79,980
Nuttyscombe twp.	172	193	38,650	2,930	.....	.....	41,580
Orlando twp.	162	140	42,590	3,050	2,220	27,293	75,153
Porter twp.	347	376	76,940	4,440	.....	.....	81,380
Wano twp.	546	599	55,660	45,270	47,006	21,397	169,333

A few high bluffs are found on some of the creeks, while the general surface of the county is undulating. Bottom lands are narrow, and the little timber along the streams is not of much value. Numerous groves that have been planted are becoming very attractive. The Republican river enters the county at its western border, six miles north of the southwestern corner; its tributaries are Cherry, Cleveland Run, Plum and Hackberry creeks from the west, and Bluff and several other creeks from the east. Beaver creek crosses the extreme southeastern corner, flowing northeast. The Arickaree river crosses the extreme northwest corner, flowing northeast.

Limestone in limited quantities is found on some of the streams.

FARM AND CROP STATISTICS.—CHEYENNE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	11,849	28,432	\$11,372 80	13,267	.....	.....
Spring wheat.....bu.	37,437	78,612	31,444 80	31,013	.....	.....
Corn.....bu.	32,529	260,232	72,864 96	43,351	.....	.....
Oats.....bu.	7,644	.....	5,457	.....	.....	.....
Rye.....bu.	2,236	20,124	8,049 60	1,804	.....	.....
Barley.....bu.	4,805	9,610	3,844 00	2,089	.....	.....
Buckwheat.....bu.	7	42	31 50	12	96	\$57 60
Irish potatoes.....bu.	767	15,340	13,499 20	705	28,200	28,200 00
Sweet potatoes.....bu.	.....	.....	.....	2	100	100 00
Castor beans.....bu.	10	50	57 50	5	25	25 00
Sorghum.....bu.	2,782	.....	9,456 00	2,415	.....	14,726 00
Flax.....bu.	210	1,470	1,249 50	159	.....	.....
Tobacco.....lbs.	.....	.....	.....	1	.....	.....
Broom corn.....lbs.	15,593	6,237,200	124,744 00	12,016	.....	.....
Millet and hungarian, tons	2,520	1,890	9,450 00	3,304	3,304	16,520 00
Milo maize.....tons	5	†	70 00	38	380	171 00
Kaffir corn.....tons	7	†	73 00	10	100	50 00
Jerusalem corn.....tons	2	†	12 00	30	240	120 00
Timothy.....tons	45	.....	.....	20	.....	.....
Clover.....tons	42	.....	.....	12	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	804	* 3,600	21,600 00	657	† 1,784	10,704 00
Orchard grass.....tons	1	.....	.....	291	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	19,899	4,502	22,510 00	21,433	3,069	18,414 00
Totals.....	139,194	.....	\$330,328 86	138,091	.....	\$89,087 60

Wheat on hand March 1, 1893, 86,323 bushels; March 1, 1894, 37,141 bushels.

Corn on hand March 1, 1893, 181,110 bushels; March 1, 1894, 54,993 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CHEYENNE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	139,194	\$330,328 86	138,091	\$89,087 60
Animals slaughtered and sold for slaughter.....	.....	99,197 00	.....	127,220 00
Milk sold.....	.....	96 00	.....	18 00
Poultry and eggs sold.....	.....	10,376 00	.....	12,266 00
Wool clip.....lbs.	219	35 04	550	71 50
Cheese.....lbs.	160	17 60	350	42 00
Butter.....lbs.	101,270	16,203 20	110,829	17,732 64
Garden products marketed.....	.....	1,669 00	.....	1,066 00
Horticultural products.....	.....	.....	.....	.....
Honey and beeswax.....lbs.	.....	.....	.....	.....
Wine manufactured.....gals.	71	71 00	65	65 00
Wood marketed.....	.....	75 00	.....	125 00
Totals.....	.....	\$458,068 70	.....	\$247,693 74

LIVE STOCK.—CHEYENNE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	4,305	\$223,860 00	5,134	\$169,422 00
Mules and asses.....	405	25,110 00	379	15,918 00
Milch cows.....	2,645	52,900 00	2,454	53,988 00
Other cattle.....	4,961	84,337 00	3,949	71,082 00
Sheep.....	79	197 50	109	272 50
Swine.....	5,844	43,830 00	5,930	41,510 00
Totals.....	18,239	\$430,234 50	17,955	\$352,192 50

Number of dogs in county March 1, 1893, 958; March 1, 1894, 871.

Number of sheep killed by dogs, year ending March 1, 1894, 6.

Number of sheep killed by wolves, year ending March 1, 1894, 1.

CLARK COUNTY.

Organized in 1885; has an area of 975 square miles, and ranks as the 93d county in population. Ashland, a little east of the center, is the county seat. Englewood, in the southwestern portion, and Minneola in the northwestern, are the other principal towns.

The Chicago, Kansas & Western railroad, a branch of the Atchison, Topeka & Santa Fé, crosses the county in the southeastern section.

The Cimarron river skirts the south line, and receives from the north Sand, Kiger, Bear, Day and Bluff creeks. These are living streams, on whose banks are occasional groves of cottonwood, walnut, elm, and hackberry. The broad valleys of these streams, united with that of the Cimarron, make the south one-third of the county an undulating lowland. The north portion is a high rolling prairie, broken by Bluff creek, a living stream, whose banks show more than half the timber in the county. Hills and rough land abound in the northeast, central and west-central portions.

An excellent quality of sandstone for building purposes, and gypsum, are found in unlimited quantities.

POPULATION AND VALUATION.—CLARK COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894. *

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,004	1,724	\$767,971	\$81,948	\$64,389	\$186,990	\$1,101,299
Appleton twp.....	240	228	\$103,541	\$5,670	\$5,830	\$51,290	\$166,331
Brown twp.....	129	111	80,165	10,374	.....	.....	90,539
Center twp.....	683	575	116,549	23,094	41,902	42,049	223,594
Cimarron twp.....	67	43	64,435	4,904	.....	.....	69,339
Edwards twp.....	79	70	62,091	6,377	.....	14,655	83,123
Englewood twp.....	208	178	60,377	11,641	13,294	31,218	116,530
Lexington twp.....	275	229	72,270	8,845	1,520	.....	82,635
Liberty twp.....	88	84	44,867	9,064	.....	.....	47,871
Sitka twp.....	144	132	74,798	3,800	.....	47,779	126,377
Vesta twp.....	91	74	88,938	4,179	1,843	.....	94,960

FARM AND CROP STATISTICS.—CLARK COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	18,739	28,104	\$11,241 60	21 170	44,455	\$13,781 05
Spring wheat.....bu.	33					
Corn.....bu.	4,148	8,296	3,733 20	2,597	12,985	6,492 50
Oats.....bu.	1,034	10,340	2,171 40	510	1,793	430 32
Rye.....bu.	1,172	7,032	2,672 16	1,125	9,000	4,050 00
Barley.....bu.	4,512	45,120	13,536 00	2,224	15,568	6,227 20
Buckwheat.....bu.						
Irish potatoes.....bu.	48	1,440	1,339 20	30	750	675 00
Sweet potatoes.....bu.	20	1,500	1,500 00	2	114	125 40
Castor beans.....bu.				20	100	100 00
Sorghum.....bu.	1,606		11,710 00	1,454		10,605 00
Flax.....bu.	1			4		
Tobacco.....lbs.						
Broom corn.....lbs.	225	90,000	1,800 00	166	11,620	290 50
Millet and hungarian, tons	885	1,327	6,635 00	493	369	1,476 00
Milo maize.....tons	192	† 576	2,016 00	133	665	299 25
Kaffir corn.....tons	2,480	† 7,440	26,040 00	2,125	10,625	5,312 50
Jerusalem corn.....tons	13	† 26	78 00	12	84	42 00
Timothy.....tons	11					
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	814	* 1,755	10,530 00	615	† 578	3,468 00
Orchard grass.....tons						
Other tame grasses.....tons	9					
Prairie grass, fenced.....tons	9,568	1,391	6,955 00	52,669	2,172	8,688 00
Totals.....	45,510		\$101,957 56	85,349		\$62,062 72

Wheat on hand March 1, 1893, 10,075 bushels; March 1, 1894, 2,331 bushels.

Corn on hand March 1, 1893, 5,105 bushels; March 1, 1894, 654 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CLARK COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	45,510	\$101,957 56	85,349	\$62,062 72
Animals slaughtered and sold for slaughter.....		68,564 00		110,770 00
Milk sold.....		430 00		56 00
Poultry and eggs sold.....		2,941 00		2,413 00
Wool clip.....lbs.			3,000	390 00
Cheese.....lbs.	835	91 85	500	60 00
Butter.....lbs.	39,378	6,300 48	42,501	6,800 16
Garden products marketed.....		597 00		20 00
Horticultural products.....				6 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	80	80 00	7	7 00
Wood marketed.....				
Totals.....		\$180,961 89		\$182,584 88

LIVE STOCK.—CLARK COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number	Value.	Number.	Value.
Horses.....	1,579	\$82,108 00	1,936	\$63,888 00
Mules and asses.....	194	12,028 00	185	7,770 00
Milch cows.....	977	19,540 00	840	18,480 00
Other cattle.....	10,257	174,369 00	6,791	122,238 00
Sheep.....	4	10 00	110	275 00
Swine.....	634	4,755 00	519	3,633 00
Totals.....	13,645	\$292,810 00	10,381	\$216,284 00

Number of dogs in county March 1, 1893, 335; March 1, 1894, 290.

CLAY COUNTY.

Was organized in 1866; has an area of 660 square miles, and ranks as the 39th county in population in the state. The city of Clay Centre, situated a little north and east of the center, on the Republican river, is the county seat. The towns of Clifton, in the northwestern portion of the county, Chapman, in the southwestern, Wakefield, in the southeastern, and Morganville, in the north-central portion, are trading and shipping points of considerable importance.

The railroads in the county are: The Kansas Central and Fort Kearney, both of the Union Pacific system; Chicago, Kansas & Western, a branch of the Atchison, Topeka & Santa Fé; Chicago, Rock Island & Pacific.

The general surface is a gently rolling prairie, except the north part of Oakland and the southern portion of Five Creeks townships. The land in the last-named localities runs to high, rocky points, and is unfit for cultivation. Not more than 5 per cent. of the county is taken up by these bad lands. Bottom lands range from one-half to 2½ miles in width, and comprise about 12 per cent. of the entire area. Timber belts average from five rods to three-eighths of a mile in width, and are composed of the following varieties of timber: Cottonwood, red and white elm, oak, ash, black walnut, mulberry, hackberry, and locust. Springs are not numerous, and well water is reached on the bottoms at an average depth of 30 feet, and at a greater depth on the uplands.

Magnesian limestone of a good quality is found in nearly every township, a very valuable ledge, from which good lime is manufactured, being quarried at Wakefield.

POPULATION AND VALUATION.—CLAY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	15,337	15,111	\$1,849,774	\$588,490	\$369,108	\$575,361	\$3,382,733
Athelstane twp.....	608	608	\$98,210	\$24,190	\$2,800		\$125,200
Blaine twp.....	643	630	154,720	30,540		\$21,354	206,614
Bloom twp.....	745	725	125,018	25,225			150,243
Chapman.....	433	571	76,375	11,630	771	29,282	118,058
Clay Centre city.....	3,241	2,932	148,620	169,334	293,724	203,262	814,940
Clay Centre twp.....	966	1,149					
Exeter twp.....	484	476	100,860	17,740			118,600
Idana city.....	126	135	95,520	19,231	4,450	30,330	149,531
Five Creeks twp.....	502	503					
Garfield twp.....	646	694	109,880	19,162			129,042
Gill twp.....	488	472	80,720	15,196			95,916
Goshen twp.....	652	626	89,060	19,895			108,955
Grant twp.....	480	422	80,805	24,305		53,363	158,473
Green city.....	219	258	88,915	25,550	8,990	22,791	146,246
Highland twp.....	602	626					
Hayes twp.....	601	590	113,650	24,620	570	17,715	156,555
Clifton city.....	305	301	129,545	48,851	21,515	29,119	229,030
Mulberry twp.....	821	717	62,940	12,835	2,171	21,387	99,333
Oakland twp.....	457	383					
Wakefield city.....	276	286	97,048	47,785	15,250	32,012	192,095
Republican twp.....	563	560					
Vining city.....	105	99					
Morganville city.....	284	276	104,840	39,435	18,867	114,746	277,888
Sherman twp.....	539	556					
Union twp.....	545	516	93,048	12,966			106,014

Sandstone is found in large quantities on all the high points all over the county. An abundance of clay suitable for brickmaking is found at several points, much of it sufficiently fine and tenacious for potters' use; also some red ocher in the south-western portion of the county. In Goshen, Highland, Chapman and Oakland townships gypsum is found.

FARM AND CROP STATISTICS.—CLAY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	44,870	157,045	\$70,670 25	42,371	432,180	\$181,515 60
Spring wheat.....bu.	20	105	47 25	32		
Corn.....bu.	111,821	2,124,599	531,149 75	110,579	165,868	79,616 64
Oats.....bu.	47,989	719,835	151,165 35	39,394	386,050	92,652 00
Rye.....bu.	1,359	20,385	8,154 00	931	13,034	5,865 30
Barley.....bu.	20			23	345	138 00
Buckwheat.....bu.	12	120	90 00	4	32	19 20
Irish potatoes.....bu.	982	14,730	11,781 00	2,035	26,455	19,841 25
Sweet potatoes.....bu.	12	300	300 00	4	1,000	900 00
Castor beans.....bu.						
Sorghum.....bu.	990		15,850 00	2,762		12,706 00
Flax.....bu.	130	650	552 50	50	250	250 00
Tobacco.....lbs.						
Broom corn.....lbs.	75	45,000	1,350 00	1		
Millet and hungarian.....tons	3,529	8,822	44,110 00	5,168	7,752	38,760 00
Milo maize.....tons	15	† 60	210 00	29	290	130 50
Kaffir corn.....tons	762	2,286	8,001 00	3,463	† 17,315	8,657 50
Jerusalem corn.....tons	10	† 20	60 00	11	110	55 00
Timothy.....tons	2,710		821			
Clover.....tons	95		31			
Blue grass.....tons	630		622			
Alfalfa.....tons	232	* 4,643	27,853 00	159	† 5,991	35,946 00
Orchard grass.....tons	77		23			
Other tame grasses.....tons	53		38			
Prairie grass, fenced.....tons	94,971	19,661	88,474 50	83,383	18,843	94,215 00
Totals.....	311,364		\$959,826 60	291,934		\$571,267 99

Wheat on hand March 1, 1893, 231,846 bushels; March 1, 1894, 108,868 bushels.

Corn on hand March 1, 1893, 763,477 bushels; March 1, 1894, 489,895 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CLAY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	311,364	\$959,826 60	291,934	\$571,267 99
Animals slaughtered and sold for slaughter.....		724,673 00		745,990 00
Milk sold.....		7,212 00		7,046 00
Poultry and eggs sold.....		45,451 00		46,964 00
Wool clip.....lbs.	862	137 92	846	109 98
Cheese.....lbs.	5,460	600 60	4,700	564 00
Butter.....lbs.	412,789	66,046 24	366,031	58,564 96
Garden products marketed.....		2,706 00		3,784 00
Horticultural products.....		3,510 00		1,550 00
Honey and beeswax.....lbs.	12,677	2,286 41	6,997	1,259 70
Wine manufactured.....gals.	7,367	7,367 00	3,021	3,021 00
Wood marketed.....		1,422 00		642 00
Totals.....		\$1,821,238 77		\$1,440,763 63

LIVE STOCK.—CLAY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	13,050	\$678,600 00	13,098	\$432,234 00
Mules and asses	5,140	318,680 00	830	34,860 00
Milch cows	7,810	156,200 00	7,226	158,972 00
Other cattle	21,944	373,048 00	17,641	317,538 00
Sheep	158	395 00	252	630 00
Swine	30,683	230,122 50	34,618	242,326 00
Totals	78,785	\$1,757,045 50	73,665	\$1,186,560 00

Number of dogs in county March 1, 1893, 1,975; March 1, 1894, 2,034.

CLOUD COUNTY.

Was organized in 1866, with an area of 720 square miles, and is the 29th county in point of population. Concordia, in the north-central portion, lying on the Republican river, is the county seat. Clyde, in the northeastern portion, Glasco in the southwestern, Miltonvale in the southeastern, and Jamestown in the north-western, are thriving towns, with a large local trade.

The lines of railroad in the county are: The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé; Union Pacific; Chicago, Nebraska & Kansas, a part of the Burlington & Missouri River; Chicago, Rock Island & Pacific; and the Central Branch, of the Missouri Pacific.

POPULATION AND VALUATION.—CLOUD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	18,037	17,044	\$2,196,692	\$469,297	\$518,992	\$773,074	\$3,958,055
Arlon twp.	662	610	\$109,300	\$5,253	.....	.....	\$114,553
Aurora twp.	714	668	100,431	11,880	\$5,394	\$32,752	150,457
Buffalo twp.	770	698	149,150	15,762	75	88,825	253,812
Center twp.	752	761	154,109	10,340	.....	.....	164,449
Colfax twp.	643	645	91,825	2,609	.....	.....	94,434
Clyde city	1,172	1,166	99,554	71,041	104,708	123,888	399,191
Elk twp.	564	543	79	.....	.....	.....	.....
Jamestown city	339	316	113,995	26,649	21,990	67,781	230,415
Grant twp.	524	478	794	.....	.....	.....	.....
Lawrence twp.	673	666	117,742	7,596	3,417	124,069	252,734
Concordia city	3,300	3,043	101,954	159,260	304,001	134,397	699,612
Lincoln twp.	382	386	170,035	18,564	.....	12,965	201,564
Lyon twp.	721	739	95,600	10,342	.....	.....	105,942
Meredith twp.	556	518	112,820	7,554	.....	17,392	137,766
Nelson twp.	694	665	91,690	9,775	.....	11,475	112,940
Oakland twp.	431	458	146,062	10,848	10,021	28,475	195,406
Shirley twp.	1,072	1,071	116,625	10,946	.....	8,966	136,537
Sibley twp.	603	608	179,005	52,970	31,167	45,970	309,112
Glasco city	408	426	.....	.....	.....	.....	.....
Solomon twp.	795	864	179,005	52,970	31,167	45,970	309,112
Miltonvale city	1,025	415	95,480	31,945	38,219	68,550	234,194
Starr twp.	509	527	942	.....	.....	.....	.....
Summit township	728	773	151,315	6,053	.....	7,569	164,937

The surface of the county is gently rolling, there being but very little rough land. About 25 per cent. of the total area is bottom land, the river and creek valleys ranging from one to three miles in width. The timber belts along the streams are narrow, and average from 10 rods to one-fourth of a mile in width. The various kinds of trees found are: Cottonwood, ash, elm, oak, hackberry, walnut, mulberry, box elder, and honey locust. There are but few springs in the county, while well water is reached at a depth of 30 feet. There are extensive salt springs and marshes in the northwestern portion of the county, south of the Republican river.

FARM AND CROP STATISTICS.—CLOUD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	52,679	199,122	\$89,604 90	41,586	176,320	\$70,528 00
Spring wheat.....bu.	95	.....	.....	85	.....	.....
Corn.....bu.	116,821	1,635,494	441,583 38	120,272	601,360	228,516 80
Oats.....bu.	44,712	536,544	128,770 56	33,836	289,290	81,001 20
Rye.....bu.	1,189	11,890	4,399 30	713	5,704	2,281 60
Barley.....bu.	93	1,395	627 75	13	130	52 00
Buckwheat.....bu.	20	120	90 00	1	8	4 80
Irish potatoes.....bu.	981	19,620	17,265 60	896	8,960	7,705 60
Sweet potatoes.....bu.	7	140	140 00	31	310	310 00
Castor beans.....bu.	30	120	138 00	.....	.....	.....
Sorghum.....bu.	1,986	.....	25,576 00	3,418	.....	17,600 00
Flax.....bu.	22	110	93 50	8	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	185	64,750	1,942 50	76	.....	.....
Millet and hungarian, tons	2,812	5,624	28,120 00	4,842	4,842	24,210 00
Milo maize.....tons	.....	.....	.....	36	360	162 00
Kaffir corn.....tons	86	344	1,204 00	630	3,150	1,575 00
Jerusalem corn.....tons	5	10	30 00	17	170	85 00
Timothy.....tons	2,074	.....	.....	378	.....	.....
Clover.....tons	169	.....	.....	30	.....	.....
Blue grass.....tons	125	.....	.....	63	.....	.....
Alfalfa.....tons	4,232	* 5,717	34,302 00	4,312	† 5,751	34,506 00
Orchard grass.....tons	144	.....	.....	12	.....	.....
Other tame grasses.....tons	99	.....	.....	59	.....	.....
Prairie grass, fenced.....tons	65,004	14,697	73,485 00	79,309	11,736	46,944 00
Totals.....	293,570	.....	\$847,372 49	290,623	.....	\$515,482 00

Wheat on hand March 1, 1893, 186,698 bushels; March 1, 1894, 110,873 bushels.

Corn on hand March 1, 1893, 774,029 bushels; March 1, 1894, 355,342 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CLOUD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	293,570	\$847,372 49	290,623	\$515,482 00
Animals slaughtered and sold for slaughter.....	.....	687,572 00	.....	604,461 00
Milk sold.....	.....	1,959 00	.....	4,978 00
Poultry and eggs sold.....	.....	62,431 00	.....	64,877 00
Wool clip.....lbs.	4,250	680 00	4,368	567 84
Cheese.....lbs.	22,820	2,510 20	16,100	1,932 00
Butter.....lbs.	485,084	77,613 44	495,228	79,236 48
Garden products marketed.....	.....	3,045 00	.....	3,014 00
Horticultural products.....	.....	1,044 00	.....	226 00
Honey and beeswax.....lbs.	10,893	1,961 93	8,967	1,614 06
Wine manufactured.....gals.	180	180 00	6	6 00
Wood marketed.....	.....	321 00	.....	640 00
Totals.....	.....	\$1,686,690 06	.....	\$1,277,064 33

Veins of coal at a depth varying from the surface to 80 feet, are found and mined to a considerable extent for local trade. There is an abundance of good quality of magnesian limestone in all parts of the county away from the immediate neighborhood of streams. Fire clay abounds in several places, but has not as yet been utilized. Deposits of potters' clay have been found in nearly every township, and have been worked extensively, especially in Elk and Shirley townships. There is also some red sandstone, but too soft to be durable.

LIVE STOCK.—CLOUD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	12,780	\$664,560 00	14,480	\$477,840 00
Mules and asses.....	808	50,096 00	900	37,800 00
Milch cows.....	7,899	157,980 00	8,170	179,740 00
Other cattle.....	20,039	340,663 00	14,769	265,842 00
Sheep.....	8,355	20,887 50	377	942 50
Swine.....	29,240	219,300 00	25,958	181,706 00
Totals.....	79,121	\$1,453,486 50	64,654	\$1,143,870 50

Number of dogs in county March 1, 1893, 2,181; March 1, 1894, 2,432.

Number of sheep killed by wolves, year ending March 1, 1894, 28.

COFFEY COUNTY.

Was organized in 1859, with a territory of 648 square miles. It ranks as the 37th county in number of inhabitants. The city of Burlington, lying a little south of the center, is the county seat. Le Roy, in the southeastern corner, Lebo, in the northwestern corner, and Waverly, in the northeast portion, are places of much local importance.

The railroads in the county are the Ottawa & Burlington, Kansas City & Emporia, and Chicago, Kansas & Western, all of the Atchison, Topeka & Santa Fé system; Missouri, Kansas & Texas, Interstate, Kansas, Nebraska & Dakota, Kansas & Arizona, and the Verdigris Valley, Independence & Western, of the Missouri Pacific system.

The general surface is a gently rolling prairie, there being but a few portions of the county too rough for cultivation. Bottom lands comprise 13 per cent. of the total area, and average from one to two miles in width. Timber belts are from one-fourth to one-half mile in width, and contain the following varieties of trees: Oak, hickory, hackberry, elm, black walnut, sycamore, soft maple, box elder, ash, locust, pecan, and some little linn, or basswood. The main stream is the Neosho river, entering the county $7\frac{1}{2}$ miles south of the northwestern corner, and crossing the southern border $5\frac{1}{2}$ miles west of the southeastern corner.

Blue, white and red sandstone and magnesian limestone are found along all of the ravines and on the hillsides. It is reported that the sandstone has no superior for flagging and building purposes. Extensive quarries are worked near Le Roy. Red ocher is met with in some localities. There are large quantities of fire clay along the Neosho river. There are several tile and brickkilns in the county.

POPULATION AND VALUATION.—COFFEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	14,801	15,400	\$2,046,479	\$418,177	\$376,476	\$627,944	\$3,469,076
Aliceville city.....		112 }					
Avon twp.....	709	615 }	\$97,249	\$13,088	\$4,159	\$18,338	\$132,834
Burlington city.....	2,167 }	2,244 }					
Burlington twp.....	729 }	682 }	159,060	124,975	251,216	73,804	609,055
California twp.....	507	541	102,073	9,868			111,941
Hampden twp.....	565	579	123,117	12,356		37,204	172,677
Key West twp.....	900	866	126,691	24,205			150,896
Le Roy city.....	756 }	792 }					
Le Roy twp.....	320 }	395 }	81,138	7,984	49,857	60,218	199,197
Gridley city.....		333 }					
Liberty twp.....	1,107	884 }	186,807	27,498	10,627	67,133	292,065
Lebo city.....	534 }	552 }					
Lincoln twp.....	531 }	577 }	112,915	41,226	24,319	54,421	232,881
Neosho twp.....	642	626	152,483	23,028	325	68,323	249,159
Ottumwa twp.....	919	1,000	162,978	23,836	1,605	33,200	221,619
Pleasant twp.....	1,006	1,113	217,028	31,922	2,505	52,663	304,118
Pottawatomie twp.....	748	822	154,473	12,934		5,207	172,614
Waverly city.....	540 }	542 }					
Rock Creek twp.....	1,013 }	944 }	165,030	48,063	31,863	113,732	358,688
Spring Creek twp.....	501	551	100,551	5,168		43,702	149,42
Star twp.....	607	630	104,886	7,026			111.91

FARM AND CROP STATISTICS.—COFFEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	10,068	149,808	\$71,907 84	6,528	88,768	\$39,945 60
Spring wheat.....bu.	22			16		
Corn.....bu.	86,623	1,905,706	571,711 80	94,930	1,234,090	493,636 00
Oats.....bu.	29,767	416,738	83,347 60	19,909	340,032	91,808 64
Rye.....bu.	463	6,945	5,125 25	296	3,848	1,654 64
Barley.....bu.	12					
Buckwheat.....bu.	44	352	264 00	8	64	38 40
Irish potatoes.....bu.	813	40,650	26,422 50	1,011	62,682	39,489 66
Sweet potatoes.....bu.	18	1,260	1,260 00	13	1,014	790 92
Castor beans.....bu.	31	248	285 20			
Sorghum.....bu.	910		12,280 00	951		11,002 80
Flax.....bu.	4,909	39,272	33,381 20	6,579	52,632	52,632 00
Tobacco.....lbs.						
Broom corn.....lbs.	30	15,000	450 00	48	7,200	252 00
Millet and hungarian.....tons	4,212	8,424	25,272 00	4,380	6,570	26,280 00
Milo maize.....tons				†	315	141 75
Kafir corn.....tons	116	† 348	1,218 00	106	3,180	1,590 00
Jerusalem corn.....tons	37	† 74	222 00	12	420	210 00
Timothy.....tons	9,375			11,740		
Clover.....tons	2,330			2,447		
Blue grass.....tons	5,487	* 5,139	30,834 00	5,516	† 8,037	48,222 00
Alfalfa.....tons	49			21		
Orchard grass.....tons	16			5		
Other tame grasses.....tons	726			706		
Prairie grass, fenced.....tons	90,411	36,508	82,143 00	82,621	45,144	135,432 00
Totals.....	246,469		\$944,124 39	237,864		\$943,126 41

Wheat on hand March 1, 1893, 4,221 bushels; March 1, 1894, 21,469 bushels.

Corn on hand March 1, 1893, 514,947 bushels; March 1, 1894, 466,936 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—COFFEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	246,469	\$944,124 39	237,864	\$943,126 41
Animals slaughtered and sold for slaughter.....		698,379 00		638,230 00
Milk sold.....		1,570 00		2,358 00
Poultry and eggs sold.....		40,093 00		46,299 00
Wool clip.....lbs.	35,042	5,606 72	12,464	1,620 00
Cheese.....lbs.	480	52 80		
Butter.....lbs.	316,896	50,703 36	356,369	57,019 04
Garden products marketed.....		4,184 00		3,559 00
Horticultural products.....		5,380 00		2,033 00
Honey and beeswax.....lbs.	10,164	1,830 36	8,688	1,564 62
Wine manufactured.....gals.	1,413	1,413 00	1,456	1,456 00
Wood marketed.....		3,011 00		1,298 00
Totals.....		\$1,756,347 63		\$1,698,563 07

LIVE STOCK.—COFFEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	12,027	\$625,404 00	12,188	\$402,204 00
Mules and asses.....	1,182	73,284 00	1,383	58,086 00
Milch cows.....	7,232	144,640 00	7,232	159,104 00
Other cattle.....	19,662	334,254 00	22,017	396,306 00
Sheep.....	4,223	10,557 50	3,134	783,500 00
Swine.....	17,315	129,862 50	22,401	156,807 00
Totals.....	61,641	\$1,318,002 00	68,365	\$1,956,007 00

Number of dogs in county March 1, 1893, 2,105; March 1, 1894, 2,066.

Number of sheep killed by wolves, year ending March 1, 1894, 7.

COMANCHE COUNTY.

Organized in 1885, and has an area of 795 square miles; ranks as the 94th county in population. The city of Coldwater, north and west of the center, is the county seat.

The Chicago, Kansas & Western railroad, a division of the Atchison, Topeka & Santa Fé, crosses the northwestern portion of the county.

The general surface is nearly level, bluffs occurring on some of the larger streams. Bottom lands vary in width from a mile to three miles. Narrow belts of timber occur along the banks of streams, and contain the following varieties of trees: Cedar, walnut, elm, hackberry, and cottonwood. Never-failing springs are numerous, and well water is found at a depth of from 20 to 50 feet. The Cimarron river, crossing the extreme southwestern corner, is the principal stream.

Magnesian limestone abounds generally. A fair quality of sandstone is found in the eastern portion of the county, and flint in the southeastern. Gypsum is met with in the eastern and southern portions, and fire clay in several localities. Red and yellow ochers are found in the northwestern and eastern sections. Salt marshes are found in the southwestern part of the county, they being at the head of the great salt plains in the Indian Territory, from which large quantities of salt are taken annually.

POPULATION AND VALUATION.—COMANCHE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,177	2,177	\$783,853	\$22,782	\$32,789	\$131,420	\$970,844
Avilla twp.....	219	168	\$135,460	\$2,870	\$745	.....	\$139,075
Coldwater twp.....	727	613	169,445	7,376	23,844	\$69,253	269,918
Irwin twp.....	41	27	36,900	880	.....	.....	37,780
Logan twp.....	159	107	43,270	1,750	.....	.....	45,020
Nescatunga twp.....	131	102	41,752	202	1,285	.....	43,239
Powell twp.....	202	146	55,890	1,566	844	31,134	89,434
Protection twp.....	255	254	75,156	3,310	3,475	31,033	112,974
Rumsey twp.....	111	75	76,510	1,670	.....	.....	78,180
Shimer twp.....	147	76	81,940	2,260	.....	.....	84,200
Valley twp.....	185	152	67,530	898	2,596	.....	71,024

FARM AND CROP STATISTICS.—COMANCHE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	23,246	72,980	\$30,651 60	21,882	65,645	\$22,975 75
Spring wheat.....bu.	30	.....	.....	26	.....	.....
Corn.....bu.	5,897	11,794	5,307 30	3,579	28,632	10,593 84
Oats.....bu.	1,893	13,251	4,240 32	674	1,210	484 00
Rye.....bu.	1,306	6,530	2,481 40	799	3,196	1,182 52
Barley.....bu.	2,960	23,680	7,814 40	1,178	7,068	2,827 20
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	49	735	698 25	41	1,763	1,763 00
Sweet potatoes.....bu.	18	360	360 00	9	513	538 65
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	1,616	.....	10,495 00	1,156	.....	5,849 00
Flax.....lbs.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	395	197,500	4,937 50	285	85,000	2,992 50
Millet and hungarian.....tons	956	956	2,868 00	211	156	312 00
Milo maize.....tons	240	720	2,520 00	43	1,290	580 50
Kafir corn.....tons	2,405	4,810	16,835 00	3,022	48,352	24,176 00
Jerusalem corn.....tons	70	140	420 00	20	500	250 00
Timothy.....tons	.....	.....	.....	2	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	5	.....	.....	.....	.....	.....
Alfalfa.....tons	38	* 1,745	10,470 00	62	† 239	1,434 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	1	.....	.....
Prairie grass, fenced.....tons	6,185	1,222	5,499 00	11,386	1,083	3,249 00
Totals.....	47,309	.....	\$105,597 77	44,376	.....	\$79,207 96

Wheat on hand March 1, 1893, 6,128 bushels; March 1, 1894, 3,029 bushels.

Corn on hand March 1, 1893, 5,128 bushels; March 1, 1894, 1,155 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—COMANCHE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	47,309	\$105,597 77	44,376	\$79,207 96
Animals slaughtered and sold for slaughter.....		42,153 00		62,659 00
Milk sold.....		331 00		55 00
Poultry and eggs sold.....		4,014 00		2,770 00
Wool clip.....lbs.	13,250	2,120 00	400	52 00
Cheese.....lbs.	555	61 05	550	66 00
Butter.....lbs.	52,709	8,433 44	44,541	7,126 56
Garden products marketed.....		1,457 00		270 00
Horticultural products.....		5 00		108 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	752	752 00	192	192 00
Wood marketed.....		210 00		94 00
Totals.....		\$165,134 26		\$152,600 52

LIVE STOCK.—COMANCHE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,794	\$93,288 00	1,810	\$59,730 00
Mules and asses.....	215	13,330 00	201	8,442 00
Milch cows.....	1,533	30,660 00	865	19,030 00
Other cattle.....	7,203	122,451 00	4,330	77,940 00
Sheep.....	2,934	7,335 00	1,501	3,752 05
Swine.....	808	6,060 00	639	4,473 00
Totals.....	14,487	\$273,124 00	9,346	\$173,367 05

Number of dogs in county March 1, 1893, 362; March 1, 1894, 281.

Number of sheep killed by wolves, year ending March 1, 1894, 20.

COWLEY COUNTY.

It has an area of 1,112 square miles; was organized in 1870, and ranks as the sixth county in population. Winfield, in the west-central portion, is the county seat. Arkansas City, on the Arkansas river, in the southwestern portion, is a thriving place, having an extensive trade with the surrounding country. Burden, Udall and Dexter are places of importance.

The county is well supplied with railroads, having branches of the Atchison, Topeka & Santa Fé and Missouri Pacific systems in all sections.

The general surface presents an undulating or rolling prairie, the eastern half being hilly, rough, and stony, while the western half is smooth and rolling. Bottom lands are very wide on the Arkansas river, averaging five miles; on the Walnut they average from one to two miles, and on the smaller creeks from one-fourth to one mile. Timber belts average from one-fourth to one-half mile in width, and contain the following varieties of trees: Cottonwood, elm, hackberry, mulberry, walnut, oak, redbud, pecan, hickory, ash, dogwood, and considerable cedar. Hedges of Osage orange have been planted to the amount of all the section lines in the county, and now average 12 years of age. There is at least one acre of timber or orchard to each

POPULATION AND VALUATION.—COWLEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	35,349	30,490	\$2,425,263	\$729,300	\$1,500,699	\$1,278,141	\$5,933,383
Beaver twp.	740	598	\$124,705	\$17,958		\$32,042	\$174,705
Bolton twp.	1,651	1,164	190,774	23,855	\$6,695	74,843	296,167
Cedar twp.	410	333	57,780	4,579		11,435	73,794
Arkansas City.	9,264	7,120					
Creswell twp.	10,203	7,960	166,390	219,007	714,659	149,680	1,249,736
Dexter city.	333	301					
Dexter twp.	1,247	1,102	124,050	24,794	19,083	60,815	228,742
Fairview twp.	602	632	92,140	12,930	1,080	58,970	165,120
Grant twp.	499	404	58,635	4,179			62,814
Harvey twp.	499	592	80,390	11,620		3,261	95,271
Liberty twp.	708	641	88,126	6,530		9,686	104,342
Maple twp.	630	544	81,992	8,320		25,284	115,596
Udall city.	343	278					
Ninnescah twp.	969	829	94,715	19,670	16,847	66,580	197,812
Omnia twp.	519	514	55,151	5,260	4,669	41,716	106,796
Other twp.	457	439	60,925	9,385		19,869	90,179
Pleasant Valley twp.	1,012	902	143,890	16,230	1,510	70,802	232,432
Richland twp.	1,270	1,184	146,776	17,545	6,943	84,545	255,809
Rock Creek twp.	661	595	96,065	12,355	1,967	35,126	145,513
Sheridan twp.	712	576	59,172	10,020	881	26,732	96,805
Burden city.	543	486					
Silver Creek twp.	1,169	1,007	76,607	34,556	24,513	47,109	182,785
Silverdale twp.	771	674	99,546	9,625	424	39,890	149,485
Spring Creek twp.	536	475	68,301	7,820	1,403	6,715	84,239
Tisdale twp.	574	532	59,310	9,380	216	22,548	91,454
Vernon twp.	890	719	127,579	17,200	2,220	123,979	270,958
Winfield city.	6,514	6,115					
Walnut twp.	7,613	7,162	139,354	206,342	693,473	168,147	1,207,316
Windsor twp.	1,007	912	132,890	20,140	4,116	98,367	255,513

FARM AND CROP STATISTICS.—COWLEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat. bu.	87,366	1,188,176	\$475,270 40	79,879	757,248	\$257,464 32
Spring wheat. bu.	43			79	1,062	329 22
Corn. bu.	111,979	1,343,748	537,499 20	106,147	849,176	322,686 88
Oats. bu.	38,280	727,320	189,103 20	39,237	753,336	226,000 80
Rye. bu.	410	8,610	3,874 50	317	3,170	1,268 00
Barley. bu.	132	2,376	1,069 20	70	700	280 00
Buckwheat. bu.	37	222	166 50	4	32	19 20
Irish potatoes. bu.	1,009	42,378	30,512 16	1,218	60,900	45,675 00
Sweet potatoes. bu.	117	2,691	2,691 00	148	14,800	8,880 00
Castor beans. bu.						
Sorghum. bu.	1,789		8,872 00	2,023		12,337 00
Cotton. lbs.	4					
Flax. bu.	378	1,890	1,606 50	341	2,046	2,046 00
Tobacco. lbs.				7	4,200	420 00
Broom corn. lbs.	527	263,500	7,905 00	473	283,800	9,933 00
Millet and hungarian, tons	4,402	5,502	22,008 00	4,408	4,408	22,040 00
Milo maize. tons	192	768	2,688 00	134	2,680	1,206 00
Kaffir corn. tons	480	960	3,360 00	696	17,400	8,700 00
Jerusalem corn. tons	12	36	108 00	55	1,100	550 00
Timothy. tons	1,373			1,029		
Clover. tons	449			205		
Blue grass. tons	1,240			991		
Alfalfa. tons	670	* 3,244	19,464 00	1,210	† 1,502	9,012 00
Orchard grass. tons	274			189		
Other tame grasses. tons	49			29		
Prairie grass, fenced. tons	114,205	46,190	138,570 00	126,804	24,693	98,772 00
Totals.	365,417		\$1,444,767 66	365,693		\$1,027,619 43

Wheat on hand March 1, 1893, 299,914 bushels; March 1, 1894, 239,040 bushels.

Corn on hand March 1, 1893, 607,318 bushels; March 1, 1894, 153,102 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

quarter section of land, which has more than doubled the live timber in the county. Good springs are found in abundance, and well water is obtained at an average depth of 20 feet east of the Walnut, and 25 feet west of that river. The water system of the county is extensive, no portion being without water courses. The Arkansas river enters the county from the west, nine miles north of the southern boundary; and has a general southeastern course, crossing the southern border 13 miles east of the southwestern corner, and is the principal stream.

A fine quality of magnesian limestone, suitable for the finest buildings, is found on the ridge between Grouse creek and Walnut river for a distance of 12 miles. Extensive quarries have been opened at Burden, Eaton, Tisdale, Dexter, Winfield, and Arkansas City. The whitest and finest quality of this stone is quarried at the two first-named places, and shipped to all parts of the state. The post-office building of the government located at Topeka is built of this material. The stone is very easily quarried and worked. Some thin layers of gypsum are found on the west side of the county, near the Arkansas river. Quite a good vein is found on the Chilocca, town 34, range 3 east, and it is in local use for plastering and whitewashing. A large salt marsh extends from Sumner county into Bolton township, in section 7, town 34, range 3 east. The famous Geuda springs, on the line between Sumner and Cowley counties, are known for their medicinal and curative properties.

SUMMARY.—COWLEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	365,417	\$1,444,767 66	365,693	\$1,027,619 42
Animals slaughtered and sold for slaughter		885,830 00		830,118 00
Milk sold.....		16,890 00		11,510 00
Poultry and eggs sold.....		99,769 00		81,163 00
Wool clip.....lbs.	17,610	2,817 60	5,212	677 56
Cheese.....lbs.	5,200	572 00	5,580	669 60
Butter.....lbs.	816,136	130,581 76	597,603	95,616 48
Garden products marketed.....		23,133 00		19,687 00
Horticultural products.....		13,409 00		13 379 00
Honey and beeswax.....lbs.	6,857	1,235 38	958	172 44
Wine manufactured.....gals.	1,295	1,295 00	1,229	1,229 00
Wood marketed.....		4,215 00		2,370 00
Totals.....		\$2,624,515 40		\$2,084,211 50

LIVE STOCK.—COWLEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	21,323	\$1,108,796 00	18,881	\$623,073 00
Mules and asses.	2,105	130,510 00	1,772	74,424 00
Milch cows.....	13,014	260,280 00	10,969	241,318 00
Other cattle.....	38,033	646 561 00	29,173	525,114 00
Sheep.....	3,117	7,792 50	3,036	7,590 00
Swine.....	35,281	264,607 50	29,848	208,936 00
Totals.....	112,873	\$2,418,547 00	93 679	\$1,680 455 00

Number of dogs in county March 1, 1893, 4,047; March 1, 1894, 3,346.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 22.

CRAWFORD COUNTY.

The county was organized in 1867, with a territory of 592 square miles, and now ranks as the fifth county in point of population. Girard, in the center, is the county seat. Pittsburg, situated in the southeastern portion, is the center of a large manufacturing and mining business. Cherokee, McCune, Walnut, Hepler and Arcadia are thriving places. Mulberry, Englevale, Monmouth, Farlington, Beulah and Opolis have a good farming trade. Frontenac, Litchfield, Bricker, Midway, Chicopee and Fleming are centers of extensive coal-mining industries. The Atchison, Topeka & Santa Fé; Fort Scott & Memphis; Missouri, Kansas & Texas; Missouri Pacific; Kansas City, Pittsburg & Gulf, and St. Louis & San Francisco railroads traverse the county.

The general surface of the county is gently undulating, and slopes gradually toward the streams. Bottom lands comprise 15 per cent. of the county area, and average from one-half to one mile in width. Timber belts border all the streams, and average from one-fourth to three-fourths of a mile in width. The varieties of trees found are: The several kinds of oak, hickory, black walnut, red and white elm, sycamore, redbud, hackberry, mulberry, papaw, persimmon, and sassafras. Springs are not abundant, and well water is reached at an average depth of 20 feet.

Limestone and sandstone are abundant in all sections of the county. There are good quarries of sandstone at Walnut and Pittsburg, and of flagstone near Farlington. Fire clay and potters' clay exist to a considerable extent in the south-

POPULATION AND VALUATION.—CRAWFORD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	31,889	33,109	\$2,182,792	\$534,567	\$1,138,504	\$1,437,138	\$5,293,001
Litchfield city.....	689	385					
Midway city.....	239	378					
Chicopee city.....	428	480					
Opolis city.....	174	142	\$413,973	\$235,084	\$733,626	\$442,664	\$1,825,347
Frontenac city.....	615	814					
Pittsburg city.....	8,139	8,545					
Baker twp.....	2,904	2,872					
Girard city.....	2,797	3,114					
Crawford twp.....	1,454	1,487	4,501	275,932	87,949	233,805	186,203
Grant twp.....	1,092	1,100	143,334	12,013	.....	7,086	162,433
Arcadia city.....	517	702	2,312	215,510	37,522	25,904	146,348
Lincoln twp.....	2,229	2,610					425,284
McCune city.....	687	693					
Osage twp.....	1,404	1,358	2,051	209,630	34,551	33,966	62,143
Sherman twp.....	1,092	1,328	192,891	25,885	5,063	82,213	306,052
Cherokee city.....	860	1,140					
Sheridan twp.....	1,792	2,010	3,150	300,119	48,366	59,479	192,768
Walnut city.....	498	511					600,732
Hepler city.....	257	256	1,949	184,437	25,152	35,720	159,929
Walnut twp.....	1,118	1,182					405,233
Frontenac city.....	486	303					
Mulberry Grove city.....	213	222	3,102	246,966	28,045	10,941	157,784
Washington twp.....	2,148	2,577					443,736

eastern portion. Coal is mined in nearly every part of the county, and is used for home manufacturing and for shipping abroad. At Pittsburg and vicinity, the largest zinc smelters in the United States are in operation, and this industry gives employment to a large number of persons. Next after agriculture, the mining of coal and lead and the smelting of zinc are the principal industries of the county.

FARM AND CROP STATISTICS.—CRAWFORD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	34,443	322,036	\$161,018 00	25,111	446,960	\$169,844 80
Spring wheat.....bu.	17	170	81 60			
Corn.....bu.	66,629	1,399,209	419,762 70	60,031	1,560,806	546,282 10
Oats.....bu.	26,153	679,978	142,795 38	24,740	712,512	171,002 88
Rye.....bu.	102	1,530	841 50	88	1,408	563 20
Barley.....bu.						
Buckwheat.....bu.	13	78	58 50	119	952	571 20
Irish potatoes.....bu.	906	36,240	21,744 00	721	39,655	19,827 50
Sweet potatoes.....bu.	68	2,584	2,584 00	33	3,135	1,786 95
Castor beans.....bu.	325	1,950	2,242 50	331	2,648	2,648 00
Sorghum.....bu.	199		3,116 00	186		3,894 00
Flax.....bu.	3,034	24,272	20,631 20	3,928	35,352	35,352 00
Tobacco.....lbs.						
Broom corn.....lbs.	51	40,800	1,224 00	49	12,250	428 75
Millet and hungarian..tons	1,168	2,920	14,600 00	1,131	1,696	5,088 00
Milo maize.....tons	20	† 80	280 00			
Kaffir corn.....tons	22	† 88	308 00	68	2,040	1,020 00
Jerusalem corn.....tons	2	† 4	12 00	5	75	37 50
Timothy.....tons	22,137			19,953		
Clover.....tons	1,061			708		
Blue grass.....tons	1,822			1,540		
Alfalfa.....tons	1	* 17,164	102,984 00		† 11,371	68,226 00
Orchard grass.....tons	10			50		
Other tame grasses.....tons	638			2,277		
Prairie grass, fenced..tons	28,500	17,191	68,764 00	27,530	12,124	36,372 00
Totals.....	187,321		\$963,047 38	168,799		\$1,062,944 88

Wheat on hand March 1, 1893, 37,547 bushels; March 1, 1894, 46,304 bushels.

Corn on hand March 1, 1893, 203,215 bushels; March 1, 1894, 119,319 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—CRAWFORD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	187,321	\$963,047 38	168,599	\$1,062,944 88
Animals slaughtered and sold for slaughter.....		293,421 00		234,794 00
Milk sold.....		10,229 00		6,330 00
Poultry and eggs sold.....		33,302 00		40,180 00
Wool clip.....lbs.	3,932	623 12	6,610	859 30
Cheese.....lbs.	5,000	550 00	3,493	419 16
Butter.....lbs.	326,755	52,280 80	311,733	49,877 28
Garden products marketed.....		11,196 00		13,058 00
Horticultural products.....		14,158 00		1,462 00
Honey and beeswax.....lbs.	15,773	2,851 60	2,936	529 16
Wine manufactured.....gals.	184	184 00	50	50 00
Wood marketed.....		670 00		378 00
Totals.....		\$1,382,518 90		\$1,410,881 78

LIVE STOCK.—CRAWFORD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	11,292	\$587,184 00	10,340	\$341,220 00
Mules and asses.....	1,749	108,438 00	1,527	64,134 00
Milch cows.....	6,441	128,820 00	5,613	123,486 00
Other cattle.....	11,454	194,718 00	9,142	164,556 00
Sheep.....	878	2,195 00	1,521	3,802 50
Swine.....	13,362	100,215 00	15,123	105,861 00
Totals.....	45,176	\$1,121,570 00	43,266	\$803,059 50

Number of dogs in county March 1, 1893, 2,050; March 1, 1894, 1,719.

Number of sheep killed by dogs, year ending March 1, 1894, 8.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

DECATUR COUNTY.

Was organized in 1880; contains an area of 900 square miles, and ranks as the 65th county in population. Oberlin, a little north and west of the center, is the county seat.

The Chicago, Rock Island & Pacific crosses the southeastern portion of the county; the Beaver Valley line crosses the northwestern portion, and the Republican Valley, Kansas & Southwestern enters the county on the east and terminates at the city of Oberlin, both of which are operated by the Burlington & Missouri River Company.

POPULATION AND VALUATION.—DECATUR COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	7,686	7,759	\$1,391,675	\$266,148	\$180,561	\$317,646	\$2,156,030
Allison twp.....	242	216	\$50,780	\$4,346	\$41	.....	\$55,167
Altory twp.....	316	299	54,110	2,985	870	\$29,659	87,624
Bassettville twp.....	178	186	53,970	7,225	.....	.....	61,195
Beaver twp.....	230	259	56,110	15,185	1,296	31,044	103,635
Center twp.....	246	278	56,700	3,415	.....	31,310	91,425
Cook twp.....	181	172	52,140	3,287	452	.....	55,879
Custer twp.....	193	214	54,860	3,970	.....	.....	58,830
Dresden twp.....	312	284	48,450	9,775	4,251	52,213	114,689
Finley twp.....	235	288	56,470	5,825	460	16,965	79,720
Garfield twp.....	257	218	52,690	3,890	369	4,210	61,159
Grant twp.....	388	409	58,265	13,815	.....	.....	72,080
Harlan twp.....	566	520	117,620	18,516	.....	.....	136,136
Jennings twp.....	364	357	55,755	18,095	11,752	28,437	114,039
Liberty twp.....	208	214	57,870	6,539	910	.....	65,319
Norcatour city.....	203 }	205 }	.....	.....	.....	.....	.....
Lincoln twp.....	373 }	377 }	57,920	25,110	16,480	25,918	125,428
Logan twp.....	401	446	107,180	10,385	.....	11,938	129,503
Lyon twp.....	222	185	49,450	1,970	.....	24,829	76,249
Oberlin city.....	933 }	922 }	69,585	83,625	142,000	8,833	304,043
Oberlin twp.....	242 }	246 }	66,100	8,195	.....	2,017	76,312
Olive twp.....	283	365	56,620	2,410	.....	50,273	109,303
Pleasant Valley twp..	270	252	49,580	3,055	1,680	.....	54,315
Prairie Dog twp.....	231	218	55,110	8,745	.....	.....	63,855
Sherman twp.....	246	354	54,340	5,785	.....	.....	60,125
Summit twp.....	866	.....	.....	.....	.....	.....	.....

The surface is an undulating prairie, the bottoms on the streams averaging from one-half to one mile in width. The streams are all fringed with belts of timber, from 100 feet to one-half mile in width, and contain the following varieties of trees: White elm, white ash, box elder, cottonwood, and hackberry, with an occasional specimen of red elm and willow.

Gray and magnesian limestone are found in the bluffs along the streams. Sandstone, an irregular concrete, is very abundant everywhere. Magnesia lime is very abundant, and by mixing it with sand and water a valuable mortar is made, equal to any other when kept dry. A clay is found one mile south of Oberlin that resembles potters' clay, but it has not yet been utilized.

FARM AND CROP STATISTICS.—DECATUR COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	25,292			22,839		
Spring wheat.....bu.	17,936			11,376	3,410	\$1,295 80
Corn.....bu.	73,727	737,270	\$184,317 50	75,627	226,881	113,440 50
Oats.....bu.	8,068			4,275		
Rye.....bu.	4,214			3,245		
Barley.....bu.	942			566		
Buckwheat.....bu.	2			5	40	24 00
Irish potatoes.....bu.	1,030	41,200	28,840 00	1,002	30,060	22,545 00
Sweet potatoes.....bu.						
Castor beans.....bu.				5	20	20 00
Sorghum.....bu.	1,131		6,162 00	1,255		6,839 00
Flax.....bu.	36	108	91 80	7		
Tobacco.....lbs.				10		
Broom corn.....lbs.	600	300,000	9,000 00	470	188,000	8,640 00
Millet and hungarian, tons	3,109	6,218	18,654 00	3,788	2,841	14,205 00
Milo maize.....tons						
Kaffir corn.....tons	45	90	315 00	94	940	470 00
Jerusalem corn.....tons	11	22	66 00	5	50	25 00
Timothy.....tons				4		
Clover.....tons	17			12		
Blue grass.....tons	20					
Alfalfa.....tons		* 2,941	17,646 00	782	† 2,796	16,776 00
Orchard grass.....tons	497					
Other tame grasses.....tons	23			15		
Prairie grass, fenced.....tons	21,272	4,499	17,996 00	30,306	5,435	27,175 00
Totals.....	157,972		\$283,088 30	155,688		\$211,455 30

Wheat on hand March 1, 1893, 110,928 bushels; March 1, 1894, 22,217 bushels.

Corn on hand March 1, 1893, 490,856 bushels; March 1, 1894, 285,604 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—DECATUR COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	157,972	\$283,088 30	155,688	\$211,455 30
Animals slaughtered and sold for slaughter.....		130,359 00		196,523 00
Milk sold.....		952 00		2,225 00
Poultry and eggs sold.....		16,543 00		19,419 00
Wool clip.....lbs.	152	24 32	210	27 30
Cheese.....lbs.	485	53 35	1,050	126 00
Butter.....lbs.	148,098	23,695 68	176,980	28,316 80
Garden products marketed.....		5,060 00		2,919 00
Horticultural products.....		8 00		
Honey and beeswax.....lbs.			100	18 00
Wine manufactured.....gals.	69	69 00	17	17 00
Wood marketed.....		285 00		337 00
Totals.....		\$460,137 65		\$461,383 40

LIVE STOCK.—DECATUR COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	5,349	\$278,148 00	6,589	\$217,437 00
Mules and asses	411	25,482 00	531	22,302 00
Milch cows	3,479	69,580 00	3,488	76,736 00
Other cattle	7,103	120,751 00	6,199	111,582 00
Sheep	11	27 50	15	37 50
Swine	12,017	90,127 50	14,214	99,498 00
Totals	28,370	\$584,116 00	31,036	\$527,592 50

Number of dogs in county March 1, 1893, 999; March 1, 1894, 1,153.

Number of sheep killed by dogs, year ending March 1, 1894, 4.

DICKINSON COUNTY.

It was organized in 1857, contains 851 square miles of territory, and ranks as the 18th in size. Abilene, lying west and north of the center, is the county seat. Herington, situated in the southeastern corner of the county, is a flourishing railroad center. Solomon and Hope have each a large local trade. Enterprise, lying five miles east of Abilene, is the center of large milling and manufacturing interests.

POPULATION AND VALUATION.—DICKINSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	20,900	21,579	\$2,402,647	\$746,199	\$630,649	\$1,014,668	\$4,794,163
Banner twp.	644	636	\$95,654	\$27,378	\$2,625	\$28,257	\$153,914
Buckeye twp.	550	559	116,415	30,957	.....	21,744	169,116
Enterprise city.	1,077 } 1,769	1,057 } 1,849	96,018	71,263	56,850	117,935	342,066
Center twp.	692 }	792 }	785	95,618	24,675	1,110	121,403
Cheever twp.	674	674	112,156	16,707	14,240	51,080	194,183
Flora twp.	622	560	607	81,467	13,767	.....	95,234
Fragrant Hill twp.	599	457	101,267	17,254	.....	.....	118,521
Garfield twp.	454	.....	.....	.....	.....	.....	.....
Abilene city.	3,712 } 4,409	3,635 } 4,357	147,043	186,095	369,817	157,470	860,425
Grant twp.	697 }	722 }	81,837	14,758	.....	2,486	99,081
Hayes twp.	503	527	85,597	14,300	4,005	42,120	146,022
Holland twp.	450	422	.....	.....	.....	.....	.....
Hope city.	586 } 1,183	501 } 1,089	100,146	28,128	19,182	52,675	200,131
Hope twp.	597 }	588 }	102,895	23,201	2,030	15,261	143,387
Jefferson twp.	756	731	119,471	31,203	3,367	39,550	193,591
Liberty twp.	620	591	102,176	32,034	42,719	139,809	317,738
Solomon city.	746 } 1,080	832 } 1,194	98,431	14,441	1,485	42,341	156,698
Lincoln twp.	334 }	362 }	90,175	65,757	90,401	158,106	404,439
Logan twp.	483	532	105,219	21,180	.....	.....	126,399
Herington city. ....	.....	1,538 } 2,065	89,286	27,706	19,469	52,457	188,918
Lyon twp.	1,735	527 }	100,823	14,854	2,581	48,802	167,060
Newbern twp.	693	672	99,528	12,911	.....	.....	112,439
Chapman city. ....	.....	497 }	84,084	12,581	.....	.....	96,665
Noble twp.	700	421 }	98,197	15,993	.....	35,690	149,880
Ridge twp.	701	576	104,861	13,872	.....	.....	118,733
Rinehart twp.	452	469	93,283	15,184	768	8,885	118,120
Sherman twp.	483	501	.....	.....	.....	.....	.....
Union twp.	527	566	.....	.....	.....	.....	.....
Wheatland twp.	338	338	.....	.....	.....	.....	.....
Willowdale twp.	475	578	.....	.....	.....	.....	.....

Manchester, situated in the northwestern corner of the county, and Chapman, near the eastern border, are towns of large local importance. There are several towns and villages of smaller size that are of much local importance.

The railroads in the county are the Chicago, Rock Island & Pacific; Atchison, Topeka & Santa Fé system; Topeka, Salina & Western, of the Missouri Pacific; the Union Pacific, and Missouri Pacific, both of which cross the county from east to west.

The surface is a gently rolling prairie, there being but few bluffs and bad lands. River bottoms average two miles in width, and those of the creeks one mile these in the aggregate comprise 20 per cent. of the county area. Timber belts on the streams average a width from 40 rods to one-half mile, and contain the following varieties of trees: Walnut, ash, elm, hackberry, coffee bean, bur oak, hickory, sycamore; and on Lyon creek, white oak, box elder, cottonwood, and honey locust. But few springs exist, and well water is reached at an average depth of 30 feet.

Limestone of excellent quality for building purposes is found throughout the eastern and central portions of the county. Yellow limestone is abundant in Lyon and Buckeye townships. A blue clay, shaded with red and yellow, is found near Abilene, and makes a good quality of paint. Beds of fire clay are located north and northwest of Abilene. Gypsum is found in the southern tier of townships, from which large quantities of stucco or plaster are being manufactured at Hope, Dillon and Carlton.

FARM AND CROP STATISTICS.—DICKINSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	103,744	622,464	\$267,659 52	95,815	1,133,483	\$430,723 54
Spring wheat.....bu.	1,157			17		
Corn.....bu.	96,035	1,344,490	363,012 30	93,833	140,750	56,300 00
Oats.....bu.	40,188	482,256	110,918 88	33,093	292,860	90,786 60
Rye.....bu.	5,050	60,600	22,422 00	4,236	42,360	16,944 00
Barley.....bu.	404	4,849	1,454 70	113	2,034	915 30
Buckwheat.....bu.	15	150	112 50	8	64	38 40
Irish potatoes.....bu.	1,002	37,074	30,771 42	1,046	52,300	33,995 00
Sweet potatoes.....bu.	49	3,773	3,773 00	60	3,000	2,610 00
Castor beans.....bu.				2	8	8 00
Sorghum.....bu.	2,533		18,842 00	4,857		23,404 00
Flax.....bu.	162	648	550 80	26		
Tobacco.....lbs.						
Broom corn.....lbs.	111	55,500	1,387 50	103		
Millet and hungarian..tons	6,764	16,910	84,550 00	3,406	4,257	21,285 00
Milo maize.....tons	12	† 48	168 00	198	1,980	891 00
Kaffir corn.....tons	1,549	† 6,196	21,686 00	4,845	48,450	24,225 00
Jerusalem corn.....tons	16	† 48	144 00	60	600	300 00
Timothy.....tons	3,090			1,851		
Clover.....tons	482			181		
Blue grass.....tons	1,180			1,315		
Alfalfa.....tons	2,121	* 3,475	20,850 00	2,310	† 3,589	21,534 00
Orchard grass.....tons	61			9		
Other tame grasses.....tons	361			67		
Prairie grass, fenced..tons	105,055	29,499	95,871 75	114,142	38,502	231,012 00
Totals.....	371,141		\$1,044,174 37	361,593		\$954,971 84

Wheat on hand March 1, 1893, 419,173 bushels; March 1, 1894, 153,217 bushels.

Corn on hand March 1, 1893, 298,805 bushels; March 1, 1894, 157,901 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—DICKINSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	371,141	\$1,044,174 37	361,593	\$954,971 84
Animals slaughtered and sold for slaughter.....		677,642 00		576,732 00
Milk sold.....		25,785 00		32,929 00
Poultry and eggs sold.....		72,164 00		67,112 00
Wool clip.....lbs.	29,277	4,684 32	6,369	831 48
Cheese.....lbs.	1,966	215 16	425	51 00
Butter.....lbs.	326,688	52,270 08	278,835	44,613 60
Garden products marketed.....		4,565 00		3,523 00
Horticultural products.....		1,385 00		1,791 00
Honey and beeswax.....lbs.	2,807	505 61	12,765	2,297 94
Wine manufactured.....gals.	4,603	4,603 00	2,542	2,542 00
Wood marketed.....		762 00		669 00
Totals.....		\$1,888,755 54		\$1,688,063 86

LIVE STOCK.—DICKINSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	15,661	\$814,372 00	15,235	\$502,755 00
Mules and asses.....	943	58,466 00	904	37,968 00
Milch cows.....	12,228	244,560 00	12,505	275,110 00
Other cattle.....	29,706	505,002 00	27,050	486,900 00
Sheep.....	6,663	16,637 50	6,240	15,600 00
Swine.....	24,948	187,110 00	31,423	219,961 00
Totals.....	90,149	\$1,826,167 50	93,357	\$1,538,294 00

Number of dogs in county March 1, 1893, 2,151; March 1, 1894, 2,028.

Number of sheep killed by dogs, year ending March 1, 1894, 18.

DONIPHAN COUNTY.

It was organized in 1855, while Kansas was yet a territory; contains 379 square miles, and is the 50th county in population. Troy, lying east and north of the center, is the county seat. White Cloud, Wathena, Highland and Severance are thriving places, and have a large trade. Other towns of importance are Leona, Denton, Doniphan, Elwood, Brenner, Bendena, Highland Station, and Iowa Point. These towns are increasing in size and importance. The city of St. Joseph, in Missouri, directly opposite the town of Elwood, and Atchison, just south of Doniphan, in Atchison county, do the bulk of the business with the county.

The Atchison & Nebraska railroad, a member of the Burlington & Missouri River system; Chicago, Rock Island & Pacific; and the St. Joseph & Grand Island, of the Union Pacific system, afford the county excellent railroad facilities.

Along the banks of the Missouri river are found many high bluffs, but the surface of the remaining portions of the county is gently undulating. Bottom lands average one mile in width, and comprise 25 per cent. of the county area. Timber belts on the creeks average one-fourth of a mile in width, while those on the Missouri are one mile wide. The principal varieties of trees found in these belts are walnut, hick-

ory, oak, and cottonwood. Well water is reached at an average depth of 25 feet, and good springs are plentiful in all sections of the county.

Limestone and sandstone of a good quality are abundant in the eastern portion, and are sometimes found in the western portion. Clay is found in the northwestern and southeastern portions. Veins of coal from 8 to 18 inches in thickness have been discovered in Wayne township. They are worked for local purposes only.

POPULATION AND VALUATION.—DONIPHAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	11,503	11,437	\$1,221,066	\$779,745	\$190,291	\$631,880	\$2,822,982
Burr Oak twp.....	744	775	\$51,235	\$8,595	.....	.....	\$59,830
Troy city.....	819	785	194,898	113,621	\$50,110	\$164,090	522,719
Center twp.....	1,198	1,280	261,540	165,085	59,625	93,460	579,710
Highland city.....	364	524	43,165	6,255	1,745	.....	51,165
White Cloud city....	508	479	145,685	56,010	7,156	63,820	272,671
Iowa twp.....	1,430	1,398	70,782	236,602	38,442	145,100	490,926
Marion twp.....	573	570	187,513	44,187	5,489	42,270	279,459
Union twp.....	848	791	266,248	149,390	27,724	123,140	566,502
Wathena city.....	631	573	.....	.....	.....	.....	.....
Elwood city.....	389	361	.....	.....	.....	.....	.....
Washington twp.....	752	697	.....	.....	.....	.....	.....
Wayne twp.....	1,200	1,158	.....	.....	.....	.....	.....
Severance city.....	425	401	.....	.....	.....	.....	.....
Leona city.....	180	192	.....	.....	.....	.....	.....
Wolf River twp.....	1,442	1,453	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—DONIPHAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	43,681	148,510	\$78,710 30	32,614	704,448	\$302,912 64
Spring wheat.....bu.	2,020	19,300	8,685 00	17	204	81 60
Corn.....bu.	72,784	3,275,280	982,584 00	61,726	1,543,150	586,397 00
Oats.....bu.	13,767	344,175	75,718 50	9,246	241,309	67,566 52
Rye.....bu.	291	4,365	1,746 00	545	10,355	3,934 90
Barley.....bu.	523	10,460	3,347 20	879	16,701	7,181 43
Buckwheat.....bu.	23	230	172 50	5	40	24 00
Irish potatoes.....bu.	1,403	91,195	50,157 25	2,126	116,930	56,126 40
Sweet potatoes.....bu.	9	900	900 00	11	1,100	1,100 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	45	.....	1,800 00	81	.....	4,860 00
Flax.....bu.	52	416	353 60	35	280	280 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	23	11,500	345 00	16	.....	.....
Millet and hungarian, tons	406	913	4,565 00	462	577	2,885 00
Milo maize.....tons	.....	.....	.....	† 9	180	81 00
Kaffir corn.....tons	.....	.....	.....	.....	.....	.....
Jerusalem corn.....tons	.....	.....	.....	.....	.....	.....
Timothy.....tons	14,777	.....	.....	13,913	.....	.....
Clover.....tons	6,534	.....	.....	8,719	.....	.....
Blue grass.....tons	1,368	* 10,188	61,128 00	1,741	† 7,764	46,584 00
Alfalfa.....tons	.....	.....	.....	12	.....	.....
Orchard grass.....tons	28	.....	.....	12	.....	.....
Other tame grasses.....tons	1,842	.....	.....	912	.....	.....
Prairie grass, fenced..tons	2,390	1,556	9,336 00	1,074	1,509	9,054 00
Totals.....	161,966	.....	\$1,279,548 35	134,155	.....	\$1,089,068 49

Wheat on hand March 1, 1893, 204,180 bushels; March 1, 1894, 115,075 bushels.
Corn on hand March 1, 1893, 740,254 bushels; March 1, 1894, 719,263 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—DONIPHAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	161,966	\$1,279,548 35	134,155	\$1,089,068 49
Animals slaughtered and sold for slaughter.....		378,889 00		400,183 00
Milk sold.....		1,967 00		751 00
Poultry and eggs sold.....		19,963 00		25,223 00
Wool clip.....lbs.	322	51 52	978	127 14
Cheese.....lbs.	2,050	225 50	30	3 60
Butter.....lbs.	211,000	33,760 00	230,498	36,879 68
Garden products marketed.....		4,741 00		6,768 00
Horticultural products.....		20,217 00		26,230 00
Honey and beeswax.....lbs.	7,892	1,423 50	7,117	1,288 60
Wine manufactured.....gals.	61,209	61,209 00	21,935	21,935 00
Wood marketed.....		8,328 00		5,212 00
Totals.....		\$1,810,322 87		\$1,613,669 51

LIVE STOCK.—DONIPHAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	5,982	\$311,064 00	6,173	\$203,709 00
Mules and asses.....	1,478	91,636 00	1,577	66,234 00
Milch cows.....	4,046	80,920 00	3,838	84,436 00
Other cattle.....	8,399	142,783 00	8,774	157,932 00
Sheep.....	305	762 50	345	862 50
Swine.....	16,589	124,417 50	26,625	186,375 00
Totals.....	36,799	\$751,583 00	47,332	\$699,548 50

Number of dogs in county March 1, 1893, 1,708; March 1, 1894, 1,639.

Number of sheep killed by dogs, year ending March 1, 1894, 3.

DOUGLAS COUNTY.

It is one of the oldest counties in the state, having been organized under the territorial government, in 1855, and was the scene of many stirring events before and during the civil war. It has an area of 469 square miles, and ranks as the 17th county in number of inhabitants. Lawrence, situated on the Kansas river, in the north-central portion, is the county seat. The first settlement of Lawrence was by a colony from New England, and the scenes enacted there during both the border and civil wars are of historic interest. Here is located the state university, which has achieved a rank admittedly among the first institutions in the land. Baldwin, in the southeastern portion, Eudora in the northeastern, and Lecompton in the north-western, are places of importance, and draw considerable trade from the surrounding country. The last-named town was once the capital of the territory of Kansas, and it was here that the bogus constitution attempting to make Kansas a slave state was passed. There are several other small towns and villages in the county that draw considerable trade from the surrounding country.

The Atchison, Topeka & Santa Fé and the Union Pacific railroads pass through the county in a western direction, and the Southern Kansas from the northern to the southern boundary of the county.

The general surface is undulating, there being but little waste land. Some high bluffs occur along the Kansas river. Bottom lands average one mile in width, and cover about 20 per cent. of the county area. Timber belts are found along all the

POPULATION AND VALUATION.—DOUGLAS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	23,104	23,113	\$1,850,303	\$787,325	\$1,420,803	\$696,800	\$4,755,231
Clinton twp.....	880	880	\$124,265	\$17,530	\$1,560	\$22,050	\$165,405
Eudora city.....	612	593	201,318	47,960	35,356	93,910	378,544
Eudora twp.....	1,326	1,271	126,880	18,350	.....	92,430	237,660
Grant twp.....	497	540	150,415	19,495	.....	1,450	171,360
Kanwaka twp.....	819	755	100,965	21,395	21,587	153,490	297,437
Lecompton city.....	468	410	217,915	63,015	.....	.....	280,930
Lecompton twp.....	731	732	310,970	70,755	83,385	63,070	528,180
Marion twp.....	1,117	1,085	433,450	491,040	1,278,915	270,400	2,473,805
Baldwin city.....	1,749	1,831	184,125	37,785	.....	.....	221,910
Palmyra twp.....	2,270	2,234	.....	.....	.....	.....	.....
Wakarusa twp.....	1,103	1,179	.....	.....	.....	.....	.....
Willow Springs twp.....	.....	.....	.....	.....	.....	.....	.....
Lawrence city:	.....	.....	.....	.....	.....	.....	.....
1st ward.....	2,395	2,468	.....	.....	.....	.....	.....
2d ward.....	2,127	2,205	.....	.....	.....	.....	.....
3d ward.....	2,544	2,485	.....	.....	.....	.....	.....
4th ward.....	1,075	1,111	.....	.....	.....	.....	.....
5th ward.....	1,059	1,090	.....	.....	.....	.....	.....
6th ward.....	932	947	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—DOUGLAS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	32,977	381,537	\$183,137 76	23,571	407,304	\$179,213 56
Spring wheat.....bu.	88	.....	.....	.....	.....	.....
Corn.....bu.	66,257	2,318,995	695,698 50	68,379	1,433,959	574,333 60
Oats.....bu.	11,433	342,990	89,177 40	8,746	186,088	55,826 40
Rye.....bu.	502	8,032	4,016 00	653	11,754	5,641 92
Barley.....bu.	.....	.....	.....	9	144	57 60
Buckwheat.....bu.	23	230	172 50	.....	.....	.....
Irish potatoes.....bu.	2,449	244,900	188,573 00	4,106	349,010	184,975 30
Sweet potatoes.....bu.	170	18,700	18,700 00	199	31,840	15,920 00
Castor beans.....bu.	56	448	615 20	10	100	100 00
Sorghum.....bu.	184	.....	1,235 00	301	.....	6,755 00
Cotton.....lbs.	21	.....	.....	.....	.....	.....
Flax.....bu.	817	5,719	4,861 15	911	9,110	9,110 00
Tobacco.....lbs.	1	.....	.....	.....	.....	.....
Broom corn.....lbs.	72	43,200	1,296 00	22	.....	.....
Millet and hungarian, tons	1,286	2,250	11,250 00	1,329	2,658	10,632 00
Milo maize.....tons	13	† 52	182 00	6	150	67 50
Kafir corn.....tons	19	† 76	266 00	64	1,280	640 00
Jerusalem corn.....tons	7	† 14	42 00	.....	.....	.....
Timothy.....tons	26,686	.....	.....	24,295	.....	.....
Clover.....tons	2,452	.....	.....	2,844	.....	.....
Blue grass.....tons	4,238	* 17,483	104,898 00	5,286	† 17,769	106,614 00
Alfalfa.....tons	9	.....	.....	19	.....	.....
Orchard grass.....tons	30	.....	.....	45	.....	.....
Other tame grasses.....tons	57	.....	.....	1,178	.....	.....
Prairie grass, fenced.....tons	30,263	12,794	67,163 50	25,067	13,768	68,840 00
Totals.....	180,110	.....	\$1,371,189 01	167,040	.....	\$1,218,777 08

Wheat on hand March 1, 1893, 64,706 bushels; March 1, 1894, 79,859 bushels.

Corn on hand March 1, 1893, 467,079 bushels; March 1, 1894, 493,202 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

streams, some of them being one mile in width, and contain the following varieties of trees: Ash, hickory, walnut, linn, hackberry, elm, the different kinds of oak, box elder, cottonwood, and sycamore. The Kansas river, flowing south of east, forms the northern boundary of the county, excepting Grant township, which is, for a distance of six miles, on the north side of the river. Springs are found in all parts of the county, and well water is reached at an average depth of 25 feet.

Limestone suitable for building is found in nearly every township; a blue limestone is being extensively quarried south of the Wakarusa, in Wakarusa township. Potters' clay is found along the Kansas river between the first and second bottoms, and fire clay exists in small quantities in Palmyra township.

SUMMARY.—DOUGLAS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	180,110	\$1,371,189 01	167,040	\$1,218,777 08
Animals slaughtered and sold for slaughter.....		545,845 00		643,811 00
Milk sold.....		7,366 00		9,408 00
Poultry and eggs sold.....		38,166 00		37,976 00
Wool clip.....lbs.	9,287	1,485 92	11,159	1,450 67
Cheese.....lbs.	600	66 00	100	12 00
Butter.....lbs.	418,047	66,887 52	414,181	66,268 96
Garden products marketed.....		68,167 00		68,780 00
Horticultural products.....		21,651 00		17,175 00
Honey and beeswax.....lbs.	6,411	1,155 38	3,405	612 90
Wine manufactured.....gals.	2,221	2,221 00	2,397	2,397 00
Wood marketed.....		8,006 00		4,115 00
Totals.....		\$2,132,205 83		\$2,070,783 61

LIVE STOCK.—DOUGLAS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	13,230	\$687,960 00	11,088	\$365,904 00
Mules and asses.....	724	44,888 00	804	33,768 00
Milch cows.....	7,358	147,160 00	6,635	145,970 00
Other cattle.....	17,731	301,427 00	16,428	295,704 00
Sheep.....	1,738	4,345 00	1,801	450,250 00
Swine.....	21,540	161,550 00	29,200	204,400 00
Totals.....	62,321	\$1,347,330 00	65,956	\$1,495,996 00

Number of dogs in county March 1, 1893, 2,677; March 1, 1894, 1,842.

Number of sheep killed by dogs, year ending March 1, 1894, 21.

Number of sheep killed by wolves, year ending March 1, 1894, 9.

EDWARDS COUNTY.

It has an area of 612 square miles, and is the 82d county in population in the state. Was organized in 1874. Kinsley, situated on the Arkansas river, west and north of the center, is the county seat.

The Atchison, Topeka & Santa Fé railroad crosses the northwestern portion of the county, and its branch, the Chicago, Kansas & Western, enters on the northeast and terminates at the city of Kinsley.

The general surface is a gently undulating prairie, much of it being nearly level. Bottom lands on the Arkansas river average about three miles in width, and cover 25 per cent. of the county area. A few scattering cottonwoods along the Arkansas river comprise about all the native timber, but fine groves of trees, from 10 to 40 acres, upon the timber-culture entries, are dotted all over the county. Springs are not numerous, but good well water is readily found at a depth of from 10 to 15 feet in the valley of the Arkansas river, and at a depth of 25 feet on the prairies. The Arkansas river enters the county at the southwest corner, and, flowing northeast, crosses the northern boundary at about the center.

Building stone of fair quality is found cropping out at the highlands where the uplands begin from the bottoms.

POPULATION AND VALUATION.—EDWARDS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	3,640	3,320	\$947,607	\$42,425	\$156,955	\$324,926	\$1,471,913
Belpre twp.....	250	217	\$97,380	\$4,085	\$1,320	\$52,818	\$155,603
Brown twp.....	507	476	185,990	5,620	.....	.....	191,610
Franklin twp.....	446	406	84,440	2,322	.....	.....	86,762
Jackson twp.....	220	192	131,890	2,570	.....	.....	134,460
Kinsley city.....	886	723	112,307	18,500	149,279	147,403	427,489
Kinsley twp.....	327	314	84,335	3,905	.....	.....	88,240
Lincoln twp.....	400	412	65,315	160	.....	.....	65,475
Logan twp.....	152	155	99,605	2,960	4,131	70,241	176,937
Trenton twp.....	236	209	86,345	2,303	2,225	54,464	146,337
Wayne twp.....	216	216	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—EDWARDS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	40,739	43,996	\$18,918 28	45,415	4,540	\$1,725 20
Spring wheat.....bu.	15	.....	.....	1	.....	.....
Corn.....bu.	12,663	63,315	24,059 70	14,841	74,205	29,682 00
Oats.....bu.	9,363	18,726	6,554 10	6,263	939	347 43
Rye.....bu.	1,071	5,353	1,874 25	760	3,040	1,216 00
Barley.....bu.	2,320	4,640	1,856 00	1,274	5,096	1,783 60
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	255	10,200	10,200 00	242	2,420	2,105 40
Sweet potatoes.....bu.	13	390	390 00	4	160	147 20
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	2,269	.....	19,056 00	4,577	.....	25,393 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	980	367,500	7,350 00	1,032	206,400	4,128 00
Millet and hungarian.....tons	2,169	2,169	6,507 00	2,127	3,721	11,163 00
Milo maize.....tons	47	75	259 00	85	850	382 50
Kaffir corn.....tons	465	930	3,255 00	1,761	17,610	8,805 00
Jerusalem corn.....tons	15	23	69 00	15	150	75 00
Timothy.....tons	.....	.....	.....	4	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	481	* 2,451	14,706 00	1,155	† 1,114	6,684 00
Orchard grass.....tons	40	.....	.....	.....	.....	.....
Other tame grasses.....tons	3	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	16,195	4,378	14,228 50	2,837	8,470	25,410 00
Totals.....	89,103	.....	\$129,282 83	82,393	.....	\$119,047 33

Wheat on hand March 1, 1893, 70,089 bushels; March 1, 1894, 21,779 bushels.

Corn on hand March 1, 1893, 24,577 bushels; March 1, 1894, 10,290 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—EDWARDS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	89,103	\$129,282 83	82,393	\$119,047 33
Animals slaughtered and sold for slaughter.....		40,560 00		61,689 00
Milk sold.....		1,495 00		1,627 00
Poultry and eggs sold.....		9,429 00		9,189 00
Wool clip.....lbs.	10,455	1,672 80	25,325	3,292 25
Cheese.....lbs.	120	13 20	11,130	1,335 60
Butter.....lbs.	92,845	14,855 20	85,545	13,687 20
Garden products marketed.....		2,218 00		1,662 00
Horticultural products.....		60 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	22	22 00		
Wood marketed.....		150 00		260 00
Totals.....		\$199,758 03		\$201,789 38

LIVE STOCK.—EDWARDS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,143	\$163,436 00	3,531	\$116,523 00
Mules and asses.....	342	21,204 00	347	14,574 00
Milch cows.....	2,854	57,080 00	2,353	51,766 00
Other cattle.....	7,304	124,168 00	4,615	83,070 00
Sheep.....	5,018	12,545 00	388	970 00
Swine.....	1,392	10,440 00	1,483	10,381 00
Totals.....	20,053	\$388,873 00	12,717	\$277,284 00

Number of dogs in county March 1, 1893, 607; March 1, 1894, 591.

Number of sheep killed by wolves, year ending March 1, 1894, 89.

ELK COUNTY.

The county of Howard, which was organized in 1870, was divided by the legislature of 1875 into the counties of Elk and Chautauqua, the territory of the former being the northern half of the county. It has an area of 651 square miles, and ranks as the 57th county in the state in population. Howard, lying a little north of the center, is the county seat. Grenola in the southwestern portion, Longton in the southeastern portion, Moline and Elk Falls in the south central, and Oak Valley in the southeastern, are places of much local importance.

The Southern Kansas, Kansas City, Emporia & Southern, members of the Atchison, Topeka & Santa Fé system, and the St. Louis, Wichita & Western, of the St. Louis & San Francisco, are the railroads in the county.

The county is rolling and in some places hilly and bluffy, but very little level prairie occurring anywhere. Bottoms cover about 20 per cent. of the county area, and average one mile in width. The timber belts along the Elk river average one-fourth of a mile in width, and contain the following varieties: Bur and post oak, elm (white and red), hackberry, box elder, maple, hickory, butternut, cottonwood, redbud, and sycamore. Good springs are numerous, and well water is found at an average depth of 20 feet.

Both blue and white limestone are found in many places, the largest deposits of the former being near Howard. The white is surface stone only, and is of an inferior quality. Sandstone is found near Longton and Elk Falls, and there is a good quality of marble near Moline. In the so-called "Flint Hills," in the northwest corner of the county, is a deposit of sulphate of lime mixed with the carbonate. Its

POPULATION AND VALUATION.—ELK COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	10,980	10,183	\$1,398,581	\$352,002	\$258,175	\$413,230	\$2,421,978
Elk Falls city.....	303 } 920	317 } 823	\$132,230	\$25,020	\$19,459	\$76,062	\$252,771
Elk Falls twp.....	617	506					
Grenola city.....	712	563	151,680	54,282	46,189	58,872	311,023
Greenfield twp.....	711 } 1,423	685 } 1,248					
Howard city.....	1,087 } 1,997	1,044 } 1,848	192,806	94,416	113,031	49,531	449,284
Howard twp.....	910	804					
Liberty twp.....		666	106,336	22,111	611	15,898	144,956
Longton city.....	556 } 1,079	519 } 1,048	101,911	18,232	29,462	52,517	202,122
Longton twp.....	523	529					
Oak Valley city.....	190 } 753	191 } 748	122,210	22,989	6,762	68,409	220,360
Oak Valley twp.....	563	557					
Painterhood twp.....		575	101,232	7,435		6,885	115,552
Pawpaw twp.....		848	120,663	16,188		30,240	167,091
Union Center twp.....		1,328	226,348	41,780			268,128
Moline city.....	569 } 1,391	558 } 1,340	143,665	49,549	42,661	54,816	290,691
Wild Cat twp.....	822	782					

FARM AND CROP STATISTICS.—ELK COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	19,561	323,928	\$136,049 76	7,796	127,376	\$52,224 16
Spring wheat.....bu.	37			20		
Corn.....bu.	56,499	1,016,982	325,434 24	63,923	1,022,768	398,879 52
Oats.....bu.	12,936	297,528	71,406 72	8,699	185,108	48,128 08
Rye.....bu.	1,774	26,610	10,644 00	25	250	107 50
Barley.....bu.	3,637					
Buckwheat.....bu.	22	176	132 00	7	56	33 60
Irish potatoes.....bu.	388	9,700	9,700 00	644	33,488	21,767 20
Sweet potatoes.....bu.	16	960	960 00	16	768	460 80
Castor beans.....bu.	40	320	368 00	15	120	120 00
Sorghum.....bu.	3,416		31,424 00	2,849		31,617 80
Flax.....bu.	8,729	61,103	51,937 55	10,529	84,232	84,232 00
Tobacco.....lbs.				1	600	60 00
Broom corn.....lbs.	147	73,500	2,205 00	105	26,250	787 50
Millet and hungarian.....tons	4,775	7,162	21,486 00	3,722	5,583	22,332 00
Milo maize.....tons	146	† 584	2,044 00	188	3,760	1,692 00
Kafir corn.....tons	628	† 1,884	6,594 00	1,499	14,990	7,495 00
Jerusalem corn.....tons	33	† 99	297 00	7	140	70 00
Timothy.....tons	1,091			1,495		
Clover.....tons	1,263			969		
Blue grass.....tons	635	* 5,827	34,962 00	889	† 4,380	26,280 00
Alfalfa.....tons	390			956		
Orchard grass.....tons	7			38		
Other tame grasses.....tons	326			207		
Prairie grass, fenced.....tons	57,038	32,727	73,635 75	98,024	25,131	50,262 00
Totals.....	173,534		\$779,280 02	202,623		\$746,549 16

Wheat on hand March 1, 1893, 7,182 bushels; March 1, 1894, 29,479 bushels.

Corn on hand March 1, 1893, 299,482 bushels; March 1, 1894, 124,279 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

supply seems to be inexhaustible. A vein of coal 18 inches thick, at a depth of eight feet, exists about eight miles northwest of Moline; also a very large deposit of blue limestone, of the best quality, near Elk Falls.

SUMMARY.—ELK COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	173,534	\$779,280 02	202,623	\$746,549 16
Animals slaughtered and sold for slaughter		594,815 00		638,731 00
Milk sold.....		457 00		718 00
Poultry and eggs sold.....		34,407 00		33,703 00
Wool clip.....lbs.	625	100 00	112	14 56
Cheese.....lbs.	16,925	1,861 75	3,180	381 60
Butter.....lbs.	307,045	49,127 20	328,675	52,588 00
Garden products marketed.....		2,595 00		2,026 00
Horticultural products		5,754 00		1,737 00
Honey and beeswax.....lbs.	6,305	1,141 55	2,508	452 33
Wine manufactured.....gals.	228	228 00	371	371 00
Wood marketed		1,312 00		694 00
Totals.....		\$1,471,078 52		\$1,477,965 70

LIVE STOCK.—ELK COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	9,000	\$468,000 00	9,290	\$306,570 00
Mules and asses.....	1,366	84,692 00	1,531	64,302 00
Milch cows.....	6,661	133,220 00	5,694	125,268 00
Other cattle.....	20,716	352,172 00	18,307	329,526 00
Sheep.....	928	2,320 00	26	65 00
Swine.....	17,031	127,732 50	18,259	127,813 00
Totals.....	55,702	\$1,168,136 50	53,107	\$953,544 00

Number of dogs in county March 1, 1893, 1,795; March 1, 1894, 1,533.

Number of sheep killed by wolves, year ending March 1, 1894, 1.

ELLIS COUNTY.

It was organized in 1867, with an area of 900 square miles, and now ranks in point of population as the 66th county in the state. Hays City, situated a little south and west of the center, is the county seat, and is the commercial emporium of the county. It has three flouring mills, four elevators, and a foundry, and many other enterprises of local importance. Ellis, in the west-central portion of the county, is a division station on the Union Pacific railroad, having the local shops of the railroad company, in which 200 men find employment. Victoria, in the eastern portion of the county, has a large flouring mill and three elevators, and is surrounded by a colony of Russians, who are large growers of wheat.

The Union Pacific railroad crosses the central portion of the county from east to west.

The general surface is undulating, with bluffs along the south side of the streams.

Bottom lands average about one mile in width, and comprise 15 per cent. of the county area. Native timber is very scarce, the belts along the streams averaging but about 10 rods in width. They contain the following varieties of trees: Maple, hackberry, white and red elm, cottonwood, green ash, box elder, and black walnut. The Saline river flows across the northern tier of townships, the Smoky Hill across

POPULATION AND VALUATION.—ELLIS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	7,663	7,517	\$959,928	\$128,510	\$197,396	\$292,894	\$1,578,728
Hays City.....		1,184 } 1,501	\$86,096	\$49,182	\$113,259	\$102,888	\$351,425
Big Creek twp.....	1,590	317 }					
Buckeye twp.....	288	313	95,005	4,849			99,854
Catharine twp.....	468	448	41,868	1,743			43,611
Ellis city.....		1,018 } 1,308	93,903	21,037	78,738	102,220	295,898
Ellis twp.....	1,583	290 }					
Freedom twp.....	372	379	43,230	3,184			46,414
Hamilton twp.....	357	384	66,830	7,733			74,563
Herzog twp.....	577	523	38,756	7,669			46,425
Lookout twp.....	365	394	59,149	2,174			61,323
Pleasant Hill twp.....		251	80,085	3,573			83,658
Saline twp.....	321	324	98,834	6,121			104,955
Smoky Hill twp.....	263	193	71,663	4,544			76,207
Victoria twp.....	317	371	50,603	5,733	1,891	49,877	108,104
Walker twp.....	587	515	68,142	7,509	3,508	37,909	117,068
Wheatland twp.....	575	613	65,764	3,459			69,223

FARM AND CROP STATISTICS.—ELLIS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	90,327			112,925	276,665	\$102,366 05
Spring wheat.....bu.	71			13		
Corn.....bu.	21,813	174,504	\$48,861 12	12,420	24,840	8,694 00
Oats.....bu.	5,994			3,630	3,192	1,053 36
Rye.....bu.	3,485			2,356	47,120	19,790 40
Barley.....bu.	6,639			3,499	24,493	9,797 20
Buckwheat.....bu.				1	8	4 80
Irish potatoes.....bu.	590	8,850	7,965 00	559	16,770	15,093 00
Sweet potatoes.....bu.	2			1	60	60 00
Castor beans.....bu.						
Sorghum.....bu.	4,587		28,896 00	5,562		29,756 00
Flax.....bu.	5	10	8 50			
Tobacco.....lbs.	4			35	17,500	1,750 00
Broom corn.....lbs.				10		
Millet and hungarian, tons	2,099	2,623	13,115 00	3,306	4,959	29,754 00
Milo maize.....tons	20	† 60	210 00	21	105	47 25
Kaffir corn.....tons	1,044	† 2,088	7,308 00	2,605	26,050	13,025 00
Jerusalem corn.....tons	371	† 742	2,226 00	648	3,240	1,620 00
Timothy.....tons	7					
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	106	* 2,587	15,522 00	125	† 10,074	60,444 00
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	32,505	4,284	17,136 00	32,739	4,643	27,858 00
Totals.....	169,669		\$141,247 62	180,455		\$321,113 06

Wheat on hand March 1, 1893, 145,883 bushels; March 1, 1894, 28,803 bushels.

Corn on hand March 1, 1893, 39,465 bushels; March 1, 1894, 13,318 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

the southern tier, and Big Creek across the south-central portion of the county, all flowing from east to west. There are also streams of minor importance. The depth at which good well water can be obtained varies from 20 to 60 feet.

Magnesian limestone is found in all parts of the county, some varieties of which are in thick, heavy layers, others in single layers just under the surface of the ground. A hard, gray limestone is found along the banks of the Smoky Hill river, running in layers from six to nine inches in thickness, and from 12 to 16 feet in length, presenting a fine surface when dressed. There is, in different portions of the county, a native lime that is, for inside walls, or where water does not reach it, even stronger than stone lime. Of this substance there are two varieties, white and brown. There are small beds of gypsum in various portions, but not valuable enough to warrant working. A bed of a superior quality of clay, from which is manufactured a durable and beautiful brick, is located at Hays City; many of the finest blocks in the city are built of this brick. Salt marshes are found in the county.

SUMMARY.—ELLIS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	169,669	\$141,247 62	180,455	\$321,113 06
Animals slaughtered and sold for slaughter.....		46,924 00		103,602 00
Milk sold.....		20 00		56 00
Poultry and eggs sold.....		10,158 00		11,172 00
Wool clip.....lbs.	131	20 96	393	51 09
Cheese.....lbs.	311	34 21	135	16 20
Butter.....lbs.	84,852	13,576 32	107,449	17,191 84
Garden products marketed.....		4,389 00		869 00
Horticultural products.....		200 00		2 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	438	438 00	202	202 00
Wood marketed.....				162 00
Totals.....		\$217,008 11		\$454,437 19

LIVE STOCK.—ELLIS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	5,569	\$289,588 00	5,800	\$191,400 00
Mules and asses.....	423	26,226 00	470	19,740 00
Milch cows.....	2,642	52,840 00	2,423	53,306 00
Other cattle.....	7,135	121,295 00	5,928	106,704 00
Sheep.....	38	95 00	256	640 00
Swine.....	1,474	11,055 00	2,459	17,213 00
Totals.....	17,281	\$501,099 00	17,336	\$389,003 00

Number of dogs in county March 1, 1893, 1,004; March 1, 1894, 1,105.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 13.

ELLSWORTH COUNTY.

It is the central county of the state; was organized in 1867; has an area of 720 square miles, and ranks as the 63d county in population. Ellsworth, lying a little north and west of the center, is the county seat. Wilson, in the northwestern corner, is an important place, doing considerable local trade. Holyrood, situated in the southwestern part of the county, has a good local trade, and is an important grain market.

The Union Pacific railroad crosses the county from east to west. The other lines are the Chicago, Kansas & Western, of the Atchison, Topeka & Santa Fé system; Kansas & Colorado and the Kanopolis & Kansas Central, of the Missouri Pacific system; also, the Kansas Midland, a branch of the St. Louis & San Francisco.

The surface is a gently rolling prairie, with high table-lands, somewhat broken and bluffy, between the streams. The bottom lands of creeks and rivers average from one-fourth to two miles in width, and contain about 10 per cent. of the county area. Timber belts average about one-fourth of a mile in width, and contain the following varieties: Cottonwood, box elder, ash, black walnut, coffee bean, honey locust, and some specimens of mulberry. Springs are numerous in all portions of the county, and well water is reached at depths varying from 20 to 60 feet. The Smoky Hill river, the most considerable stream, enters the county from the west, about six miles south of the northwestern corner.

Magnesian limestone is abundant in the northern portion, and red and brown sandstone in the central and southeastern. A mineral paint of good quality is found in several localities. Fire clay of good quality is found in the central and eastern portions of the county. Potters' clay is found in many places, a sample of which has been tested and pronounced excellent. Gypsum exists in large quantities on all of the high lands. Red and yellow ochers are found in all the rolling portions of the county.

At Kanopolis, $4\frac{1}{2}$ miles southeast of the city of Ellsworth, a deposit of a good quality of salt is found and mined.

POPULATION AND VALUATION.—ELLSWORTH COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	9,597	8,752	\$1,541,930	\$255,000	\$322,213	\$570,814	\$2,590,937
Columbia twp.	890	809	\$195,950	\$16,660	\$1,035	\$66,978	\$280,613
Kanopolis city.	334	244					
Ellsworth city.	1,753	1,403	94,250	65,335	243,514	82,576	485,675
Ellsworth twp.	362	295					
Empire twp.	817	785	278,000	35,630		64,144	377,774
Garfield twp.	756	701	248,890	31,390	1,061	79,866	361,207
Green Garden twp. ...	555	543	106,960	12,555	3,797	61,227	184,539
Langley twp.	328	327	66,860	7,510	2,036	40,306	116,712
Lincoln twp.	316	312	69,030	5,135		27,227	101,392
Noble twp.	452	436	66,460	3,240		15,503	85,203
Palacky twp.	440	450	81,260	6,970			88,230
Sherman twp.	383	393	61,580	6,485			76,065
Thomas twp.	264	269	72,900	5,520	600	45,987	125,007
Valley twp.	626	604	92,170	19,500	10,940	32,415	155,025
Wilson city.	809	766					
Wilson twp.	512	415	99,620	39,086	59,230	54,585	152,895

FARM AND CROP STATISTICS.—ELLSWORTH COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	103,776	392,268	\$164,752 56	92,421	426,979	\$166,521 81
Spring wheat.....bu.	236			33		
Corn.....bu.	48,568	485,680	131,133 60	29,818	149,090	65,599 60
Oats.....bu.	7,553	60,424	18,127 20	3,950	15,990	5,116 80
Rye.....bu.	2,034	10,170	3,356 10	1,548	15,480	5,882 40
Barley.....bu.	713			53	265	106 00
Buckwheat.....bu.	3					
Irish potatoes.....bu.	555	19,425	16,705 50	488	5,856	5,036 16
Sweet potatoes.....bu.	12	756	756 00	14	658	592 20
Castor beans.....bu.						
Sorghum.....bu.	2,868		17,892 00	2,823		15,102 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	70	42,000	1,260 00	20	10,000	260 00
Millet and hungarian, tons	1,103	2,206	11,030 00	738	1,107	6,642 00
Milo maize.....tons	244	† 976	3,416 00	283	2,830	1,273 50
Kaffir corn.....tons	225	† 675	2,363 00	451	4,510	2,255 00
Jerusalem corn.....tons	5	† 10	30 00	8	80	40 00
Timothy.....tons	2			2		
Clover.....tons	1					
Blue grass.....tons	4			2		
Alfalfa.....tons	268	* 3,074	18,444 00	168	† 2,177	13,062 00
Orchard grass.....tons	10			3		
Other tame grasses.....tons	14					
Prairie grass, fenced.....tons	25,912	7,793	25,827 25	47,924	7,426	22,278 00
Totals.....	194,176		\$414,593 21	180,749		\$309,757 47

Wheat on hand March 1, 1893, 275,849 bushels; March 1, 1894, 118,985 bushels.

Corn on hand March 1, 1893, 165,845 bushels; March 1, 1894, 85,604 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—ELLSWORTH COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	194,176	\$414,593 21	180,749	\$309,757 47
Animals slaughtered and sold for slaughter.....		273,353 00		317,642 00
Milk sold.....		330 00		1,231 00
Poultry and eggs sold.....		43,320 00		30,974 00
Wool clip.....lbs.	20,345	3,255 20	4,988	648 44
Cheese.....lbs.	7,215	793 65	6,550	786 00
Butter.....lbs.	216,420	34,627 20	167,735	26,837 60
Garden products marketed.....		3,410 00		2,682 00
Horticultural products.....		705 00		20 00
Honey and beeswax.....lbs.			97	17 62
Wine manufactured.....gals.	558	558 00	111	111 00
Wood marketed.....		215 00		204 00
Totals.....		\$775,160 26		\$690,911 13

LIVE STOCK.—ELLSWORTH COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	6,763	\$351,676 00	5,938	\$195,954 00
Mules and asses.....	642	39,804 00	572	24,024 00
Milch cows.....	3,673	73,460 00	3,392	74,624 00
Other cattle.....	15,406	261,902 00	11,114	200,052 00
Sheep.....	2,356	5,890 00	104	260 00
Swine.....	4,619	34,642 50	4,305	30,135 00
Totals.....	33,459	\$767,374 50	25,425	\$525,049 00

Number of dogs in county March 1, 1893, 1,313; March 1, 1894, 1,100.

FINNEY COUNTY.

Was organized in 1884. It is the 81st county in population in the state. Garden City, situated on the Arkansas river, is the county seat, and is in the famous irrigation district. About one-third of the county is level upland, gently sloping to the southeast, and nearly all of it susceptible of irrigation, and is now "under the ditches."

The main line of the Atchison, Topeka & Santa Fé railroad extends across the county from east to west.

POPULATION AND VALUATION.—FINNEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	3,388	3,553	\$920,172	\$118,445	\$265,149	\$293,829	\$1,597,595
Garfield twp.		546	\$239,915	\$11,940	\$3,530		\$255,385
Garden City	1,673	1,392	208,070	73,383	256,259	\$111,542	649,254
Garden City twp.	492	531					
Ivanhoe twp.	138	112	41,400	1,978			43,378
Pierceville twp.	217	126	80,669	5,090	3,682	79,392	168,833
Pleasant Valley twp.	94	171	80,657	2,462			83,119
Sherlock twp.	326	363	140,631	12,670	200	102,895	256,396
Terry twp.	448	312	128,830	10,922	1,478		141,230

FARM AND CROP STATISTICS.—FINNEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	16,937	1,014	\$446 16	26,607	26,670	\$9,601 20
Spring wheat.....bu.	939			821	786	290 82
Corn.....bu.	1,281	5,124	2,049 60	1,571	6,284	2,325 08
Oats.....bu.	4,121	41,210	10,302 50	3,456	23,205	6,729 45
Rye.....bu.	1,470	7,350	2,940 00	601	5,409	2,001 33
Barley.....bu.	3,453			3,589	35,890	15,432 70
Buckwheat.....bu.						
Irish potatoes.....bu.	188	9,400	9,400 00	235	14,100	10,998 00
Sweet potatoes.....bu.	115	11,500	11,500 00	138	14,490	11,302 20
Castor beans.....bu.				3	12	12 00
Sorghum.....bu.	3,743		20,024 00	7,035		36,230 00
Flax.....bu.	32	96	81 60	75		
Tobacco.....lbs.						
Broom corn.....lbs.	1,071	535,500	13,387 50	591	265,950	7,978 50
Millet and hungarian.....tons	727	727	2,908 00	1,299	1,948	5,844 00
Milo maize.....tons	245	† 744	2,604 00	189	3,402	1,530 90
Kafir corn.....tons	822	† 1,644	5,754 00	2,794	55,880	27,940 00
Jerusalem corn.....tons	2,147	† 4,294	12,882 00	2,612	50,240	25,120 00
Timothy.....tons	2					
Clover.....tons				601		
Blue grass.....tons	1	* 16,676	100,056 00	† 14,589		87,534 00
Alfalfa.....tons	6,990			9,128		
Orchard grass.....tons	1					
Other tame grasses.....tons	15			51		
Prairie grass, fenced.....tons	3,396	871	4,137 25	901	11,762	35,236 00
Totals.....	47,699		\$198,472 61	62,287		\$286,156 18

Wheat on hand March 1, 1893, 7,922 bushels; March 1, 1894, 357 bushels.

Corn on hand March 1, 1893, 723 bushels; March 1, 1894, 19 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Springs are not plentiful, but well water can be obtained at from 50 to 100 feet on the uplands, and in the Arkansas valley at a few feet below the surface. The valley of the Arkansas river is from four to six miles in width, and contains about all the bottom land in the county. A few scattering cottonwood trees are found along this stream.

Clay suitable for the manufacture of brick and potters' clay are found in various sections; gypsum, also, in limited quantities.

A good quality of limestone and sandstone is found in large quantities on the high lands north of the Pawnee river.

SUMMARY.—FINNEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	47,699	\$198,472 61	62,287	\$286,156 13
Animals slaughtered and sold for slaughter.....		55,532 00		77,042 00
Milk sold.....		800 00		400 00
Poultry and eggs sold.....		7,617 00		6,644 00
Wool clip.....lbs.	23,200	3,712 00	25,898	3,366 74
Cheese.....lbs.	395	43 45	4,010	481 20
Butter.....lbs.	57,433	9,189 28	91,906	14,704 96
Garden products marketed.....		7,406 00		6,825 00
Horticultural products.....		575 00		12 00
Honey and beeswax.....lbs.	3,945	715 35	2,756	496 03
Wine manufactured.....gals.			572	572 00
Wood marketed.....				97 00
Totals.....		\$284,062 69		\$396,797 16

LIVE STOCK.—FINNEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,776	\$92,352 00	3,106	\$102,498 00
Mules and asses.....	169	10,478 00	195	8,190 00
Milch cows.....	1,554	31,080 00	1,690	37,180 00
Other cattle.....	4,464	75,888 00	4,433	79,794 00
Sheep.....	5,677	14,192 50	3,923	9,807 50
Swine.....	724	5,430 00	917	6,419 00
Totals.....	14,364	\$229,420 50	14,261	\$243,888 50

Number of dogs in county March 1, 1893, 270; March 1, 1894, 389.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 75.

FORD COUNTY.

This county was organized in 1873, and since that time has had territory added to and taken from it. In 1886 it had an area of 1,440 square miles; but by an act of the legislature, in 1887, 10 congressional townships on the west were taken from it to form a portion of the new county of Gray, leaving it in size 1,040 square miles. It ranks as the 76th county in point of population. Dodge City, lying on the Arkansas river, northwest of the center, is the county seat, and the seat of the office of

the United States land district. Speareville, Ford, and Bucklin, situated in the eastern portion of the county, and Wilburn, in the southwestern portion, are places of local importance.

The Atchison, Topeka & Santa Fé railroad crosses the northern portion of the county. The other lines of railroad are the Dodge City, Montezuma & Trinidad, and the Chicago, Kansas & Nebraska, a branch of the Chicago, Rock Island & Pacific system.

POPULATION AND VALUATION.—FORD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	5,692	5,096	\$1,131,298	\$70,042	\$310,797	\$681,243	\$2,193,380
Bloom twp.....	55	41	\$81,360	\$320	\$738	\$49,862	\$132,280
Bucklin twp.....	267	207	37,372	4,121	5,433	19,766	66,692
Concord twp.....	109	90	62,304	259	.....	.....	62,563
Dodge City.....	2,026	1,811	124,971	36,540	278,775	153,612	593,898
Dodge twp.....	260	226	.....	.....	.....	.....	.....
Fairview twp.....	217	185	72,017	2,377	.....	71,455	145,349
Ford city.....	118	77	96,590	2,045	7,299	60,976	166,910
Ford twp.....	311	340	.....	.....	.....	.....	.....
Grandview twp.....	648	589	91,985	2,056	407	63,433	157,881
Pleasant Valley twp.	160	163	78,829	3,018	207	22,547	104,601
Richland twp.....	73	85	49,419	1,695	673	.....	51,787
Royal twp.....	164	115	67,933	1,683	.....	.....	69,616
Sodville twp.....	101	76	40,970	785	170	32,493	74,418
Speareville twp.....	692	553	189,487	9,142	15,090	138,034	351,753
Wheatland twp.....	391	375	75,803	2,959	1,636	69,065	149,463
Wilburn twp.....	190	163	62,258	3,042	369	.....	65,669

FARM AND CROP STATISTICS.—FORD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	38,242	24,472	\$10,522 96	47,209	41,540	\$18,277 60
Spring wheat.....bu.	360	125	52 50	94	36	14 4
Corn.....bu.	9,451	37,804	16,633 76	8,097	12,145	6,072 50
Oats.....bu.	8,301	33,204	9,961 20	6,348	11,680	4,555 20
Rye.....bu.	3,463	17,315	6,926 00	2,773	13,865	6,100 60
Barley.....bu.	7,794	31,176	11,535 12	3,995	23,970	10,307 10
Buckwheat.....bu.	1	.....	.....	1	8	4 80
Irish potatoes.....bu.	335	3,350	3,015 00	215	3,870	3,483 00
Sweet potatoes.....bu.	9	432	432 00	5	215	215 00
Castor beans.....bu.	7	21	24 15	10	30	30 00
Sorghum.....bu.	2,948	.....	15,262 00	2,742	.....	18,922 20
Flax.....bu.	27	108	91 80	1	2	2 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	61	30,500	762 50	167	10,020	250 00
Millet and hungarian, tons	1,212	1,818	9,090 00	1,472	1,472	7,360 00
Milo maize.....tons	16	48	168 01	17	153	68 85
Kaffir corn.....tons	1,171	1,757	6,149 00	1,499	14,990	7,495 00
Jerusalem corn.....tons	68	68	204 00	53	477	238 50
Timothy.....tons	3	.....	.....	.....	.....	.....
Clover.....tons	4	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	1,779	4,125	24,750 00	1,790	1,357	8,142 00
Orchard grass.....tons	17	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	11,387	4,703	19,987 75	6,031	6,413	25,652 00
Totals.....	86,656	.....	\$135,567 74	82,519	.....	\$117,190 75

Wheat on hand March 1, 1893, 37,312 bushels; March 1, 1894, 7,533 bushels.

Corn on hand March 1, 1893, 13,542 bushels; March 1, 1894, 894 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface is nearly level, there being but few bluffs and but little rough lands. The only bottom land in the county is on the Arkansas river, the valley of which varies from one to two miles in width. Bottom lands comprise 10 per cent. of the total area. A small fringe of timber occurs on some of the streams, the varieties of trees found being cottonwood, elm, hackberry, and a few walnuts. The Arkansas river enters the county seven miles south from the northwestern corner, flowing in a southeasterly course, passing over the eastern border 18 miles south of the northeastern corner.

A good quality of magnesian limestone is found north and east of Dodge City, and a fair quality of sandstone crops out of the bluffs along the Arkansas river. Fire clay and gypsum exist in the northern portion, along Duck and Saw Log creeks.

SUMMARY.—FORD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	86,656	\$135,567 74	82,519	\$117,190 75
Animals slaughtered and sold for slaughter.....		64,644 00		47,850 00
Milk sold.....		2,600 00		1,524 00
Poultry and eggs sold.....		12,380 00		11,056 00
Wool clip.....lbs.	1,037	165 92	749	97 37
Cheese.....lbs.	1,825	200 75	500	60 00
Butter.....lbs.	102,946	16,471 36	97,994	15,679 04
Garden products marketed.....		4,128 00		1,218 00
Horticultural products.....		1,010 00		440 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	60	60 00	16	16 00
Wood marketed.....		1 00		
Totals.....		\$237,228 77		\$195,131 16

LIVE STOCK.—FORD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,149	\$163,748 00	3,470	\$114,510 00
Mules and asses.....	286	17,732 00	266	11,172 00
Milch cows.....	2,776	55,520 00	2,606	57,332 00
Other cattle.....	6,320	107,440 00	4,610	82,980 00
Sheep.....	680	1,700 00	237	592 50
Swine.....	1,561	11,707 50	1,365	9,555 00
Totals.....	14,772	\$357,847 50	12,554	\$276,141 50

Number of dogs in county March 1, 1893, 708; March 1, 1894, 645.

Number of sheep killed by wolves, year ending March 1, 1894, 11.

FRANKLIN COUNTY.

It was one of the original counties, organized while the state was yet a territory, in 1857. It has an area of 576 square miles, and ranks in population as the 23d county in the state. The city of Ottawa, lying north of the center, is the county seat. It is a place of much importance, and has a large trade.

The railroads in the county are: The Southern Kansas, Ottawa & Burlington, and

the Kansas City & Emporia, members of the Atchison, Topeka & Santa Fé system; the Kansas & Arizona, and the Council Grove, Osage City & Ottawa, of the Missouri Pacific.

POPULATION AND VALUATION.—FRANKLIN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	19,684	19,980	\$2,295,430	\$886,328	\$984,891	\$773,863	\$4,940,511
Appanoose twp.....	598	590	\$103,050	\$21,707			\$124,757
Centropolis twp.....	1,006	1,063	162,455	34,970	\$3,946	\$24,047	225,418
Cutler twp.....	883	875	154,290	38,781	2,130	31,052	226,253
Wellsville city.....	402	449					
Franklin twp.....	705	662	184,550	101,447	33,032	62,365	381,394
Greenwood twp.....	685	676	87,465	19,297		35,034	141,796
Harrison twp.....	666	657	156,605	23,375	3,108	32,466	215,554
Hayes twp.....	575	620	127,198	37,016	1,230	51,555	216,999
Homewood twp.....	645	688	109,341	30,512		34,378	174,231
Lincoln twp.....	626	507	131,967	23,062	1,125	71,319	227,473
Ohio twp.....	829	781	159,400	39,388	12,334	52,019	263,140
Ottawa twp.....	1,020	1,000	280,932	315,455	836,508	201,082	1,633,977
Peoria twp.....	782	774	137,300	39,567	3,235	23,151	203,253
Pomona city.....	470	520					
Pomona twp.....	389	412	70,035	29,557	31,220	58,072	188,884
Pottawatomie twp...	952	962	128,213	27,501	13,865	29,777	199,356
Richmond twp.....	752	872	127,242	33,299	10,375	27,748	198,664
Williamsburg twp...	1,161	1,203	175,387	71,394	32,783	39,798	319,362
Ottawa city:*							
1st ward.....	1,881	1,963					
2d ward.....	2,050	2,061					
3d ward.....	1,819	1,831					
4th ward.....	788	814					

*In Ottawa township.

FARM AND CROP STATISTICS.—FRANKLIN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	14,919	212,595	\$102,045 60	10,832	171,241	\$71,921 22
Spring wheat.....bu.	95					
Corn.....bu.	86,812	2,170,300	694,496 00	87,784	1,316,760	474,033 60
Oats.....bu.	15,355	307,100	70,633 00	9,876	182,700	61,156 00
Rye.....bu.	230			395	7,110	3,199 50
Barley.....bu.	8	144	57 60	38	608	243 20
Buckwheat.....bu.	81	810	607 50	55	440	264 00
Irish potatoes.....bu.	941	88,454	60,148 72	1,289	59,294	33,204 64
Sweet potatoes.....bu.	56	6,720	6,720 00	20	2,100	1,512 00
Castor beans.....bu.	294	2,352	2,704 80	200	2,400	2,400 00
Sorghum.....bu.	325		7,990 00	438		20,859 00
Flax.....bu.	3,536	21,216	18,033 60	2,911	26,199	26,199 00
Tobacco.....lbs.	40	24,000	2,400 00	47	61,100	6,110 00
Broom corn.....lbs.				6		
Millet and hungarian, tons	2,964	5,187	15,561 00	2,297	3,445	13,780 00
Milo maize.....tons				1	25	11 25
Kafir corn.....tons				2	40	20 00
Jerusalem corn.....tons				1	24	12 00
Timothy.....tons	28,974			30,988		
Clover.....tons	3,435			3,427		
Blue grass.....tons	4,740			4,622		
Alfalfa.....tons	20			58		
Orchard grass.....tons	9			15		
Other tame grasses.....tons	1,484			2,280		
Prairie grass, fenced...tons	68,638	17,983	58,444 75	60,516	19,585	78,340 00
Totals.....	232,956		\$1,149,372 57	218,098		\$923,893 41

Wheat on hand March 1, 1893, 17,401 bushels; March 1, 1894, 35,262 bushels.

Corn on hand March 1, 1893, 504,853 bushels; March 1, 1894, 475,019 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The surface is a gently undulating prairie, bottom lands covering about 17 per cent. of the total county area. The valleys on the creeks average one mile in width, while on the Marais des Cygnes they spread out to the width of two miles. Timber belts average from one-half to one mile in width, and contain the following varieties of trees: Walnut, oak, hickory, elm, cottonwood, hackberry, mulberry, soft maple, ash, locust, and willow. Springs are plentiful, some of them being of great value, and well water is reached at an average depth of 25 feet. The Marais des Cygnes river enters the county from the west, north of the center, and flows over the eastern border nine miles north from the southern boundary.

Limestone and sandstone, suitable for building purposes, are found all over the county. Valuable quarries of these stone, also of paving stone, are located near the city of Ottawa. Deposits of mineral paint, cement rock and fire clay are found near the town of Williamsburg, in the southwestern portion of the county. Coal of good quality is found in several localities, the principal mines being at Ottawa, Centropolis, Pomona, Ransomville, and Williamsburg. The supply from these mines far exceeds the local demand, and much is shipped to other counties.

SUMMARY.—FRANKLIN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	232,956	\$1,149,372 57	218,098	\$923,893 41
Animals slaughtered and sold for slaughter.....		676,934 00		717,513 00
Milk sold.....		6,335 00		5,465 00
Poultry and eggs sold.....		38,429 00		49,656 00
Wool clip.....lbs.	2,402	384 32	3,885	505 03
Cheese.....lbs.				
Butter.....lbs.	401,776	64,284 16	392,855	62,856 80
Garden products marketed.....		10,997 00		6,819 00
Horticultural products.....		1,948 00		1,269 00
Honey and beeswax.....lbs.	13,742	2,475 52	14,885	2,687 42
Wine manufactured.....gals.	506	506 00	530	530 00
Wood marketed.....		2,914 00		987 00
Totals.....		\$1,954,579 57		\$1,772,181 68

LIVE STOCK.—FRANKLIN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	12,197	\$634,244 00	11,395	\$376,035 00
Mules and asses.....	909	56,358 00	985	41,370 00
Milch cows.....	8,169	163,380 00	7,484	164,648 00
Other cattle.....	18,262	310,454 00	20,269	364,842 00
Sheep.....	725	1,812 50	989	2,472 50
Swine.....	19,908	149,310 00	25,393	177,751 00
Totals.....	60,170	\$1,315,558 50	66,515	\$1,127,118 50

Number of dogs in county March 1, 1893, 1,983; March 1, 1894, 1,925.

Number of sheep killed by dogs, year ending March 1, 1894, 11.

Number of sheep killed by wolves, year ending March 1, 1894, 73.

GEARY COUNTY.

Was organized in 1855, and ranks as the 58th in population, and is the third smallest county in Kansas. Junction City, lying north and west of the center, is the county seat. The town of Milford, in the northwestern portion, is a place of considerable local importance. At Fort Riley, situated on the Kansas river, three miles from Junction City, the largest military post in the United States is located.

POPULATION AND VALUATION.—GEARY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	9,632	10,091	\$969,424	\$274,633	\$537,705	\$354,314	\$2,136,076
Blakely twp.....	333	331	\$67,180	\$5,355	.....	\$13,353	\$85,888
Jackson twp.....	284	299	55,430	9,535	.....	.....	64,965
Jefferson twp.....	553	601	122,559	18,759	.....	.....	141,318
Liberty twp.....	695	752	107,650	10,527	.....	.....	118,177
Lyon twp.....	499	517	125,320	13,805	.....	40,659	179,784
Milford twp.....	713	719	125,385	34,911	\$9,605	30,077	199,978
Junction City.....	5,063	5,066	291,810	171,916	528,100	270,225	1,262,051
Smoky Hill twp.....	1,075	1,361	.....	.....	.....	.....	.....
Wingfield twp.....	417	445	74,090	9,825	.....	.....	83,915

FARM AND CROP STATISTICS.—GEARY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	21,197	156,850	\$72,151 00	15,586	200,746	\$84,313 32
Spring wheat.....bu.	40	.....	.....	5	.....	.....
Corn.....bu.	37,500	900,000	234,000 00	39,248	235,488	94,195 20
Oats.....bu.	9,145	146,320	30,727 20	8,445	164,160	45,964 80
Rye.....bu.	922	11,986	4,075 24	606	10,908	4,799 52
Barley.....bu.	37	629	239 00	59	826	346 92
Buckwheat.....bu.	10	60	45 00	13	104	62 40
Irish potatoes.....bu.	533	28,782	18,996 12	768	19,200	14,592 00
Sweet potatoes.....bu.	56	4,928	4,928 00	23	1,265	1,189 10
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	216	.....	2,142 00	601	.....	3,581 00
Flax.....bu.	1	9	7 65	40	120	30 00
Tobacco.....lbs.	1	.....	.....	1	300	20 00
Broom corn.....lbs.	.....	.....	.....	8	800	20 00
Millet and hungarian.....bu.	947	1,894	9,470 00	1,464	1,464	7,320 00
Milo maize.....tons	3	†	42 00	12	120	54 00
Kaffir corn.....tons	142	†	1,988 00	293	2,930	1,465 00
Jerusalem corn.....tons	.....	.....	.....	.....	.....	.....
Timothy.....tons	209	.....	.....	216	.....	.....
Clover.....tons	3	.....	.....	3	.....	.....
Blue grass.....tons	39	.....	.....	29	.....	.....
Alfalfa.....tons	524	522	3,132 00	622	† 1,181	7,086 00
Orchard grass.....tons	97	.....	.....	46	.....	.....
Other tame grasses.....tons	55	.....	.....	80	.....	.....
Prairie grass, fenced.....tons	26,785	10,629	34,544 25	24,543	17,428	69,712 00
Totals.....	98,462	.....	\$416,487 48	92,711	.....	\$334,851 26

Wheat on hand March 1, 1893, 66,280 bushels; March 1, 1894, 37,596 bushels.

Corn on hand March 1, 1893, 77,822 bushels; March 1, 1894, 127,000 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The lines of railroad in the county are: The Union Pacific, and its branch, the Junction City & Fort Kearney; also, the Missouri, Kansas & Texas.

The Smoky Hill and Republican rivers, the former flowing northeast and the latter southeast, form a junction within a few miles of Junction City, and form the Kansas river. The eastern and middle portions of the county are rough and bluffy on the streams, while the southeast and west are an undulating prairie. Bottoms average three-fourths of a mile in width, and in the aggregate make 15 per cent. of the total county area. Timber belts, averaging one-fourth of a mile in width, are found along the streams, and contain the following varieties of trees: White and red elm, cottonwood, white ash, walnut, hackberry, mulberry, oak, hickory, and box elder. Springs are abundant, a few of them being of great value, while well water is readily found at an average depth of 25 feet.

Magnesian limestone of a superior quality is found in nearly all sections, the principal quarry being in the bluffs west of Junction City. The east wing of the capitol building at Topeka is constructed of material from these quarries. Cement rock is found at New Milford and Wreford. A good quality of salt brine has been discovered at Junction City, at a depth of 500 feet. A vast bed of rock salt is supposed to underlie that city.

SUMMARY.—GEARY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	98,462	\$416,487 48	92,711	\$334,851 26
Animals slaughtered and sold for slaughter.....		297,094 00		346,858 00
Milk sold.....		5,040 00		4,660 00
Poultry and eggs sold.....		17,704 00		37,219 00
Wool clip.....lbs.	4,945	791 20	4,835	628 55
Cheese.....lbs.	1,500	165 00	200	24 00
Butter.....lbs.	165,794	26,527 04	200,667	32,106 72
Garden products marketed.....		5,907 00		9,000 00
Horticultural products.....		2,635 00		3,706 00
Honey and beeswax.....lbs.	2,948	530 92	2,498	451 94
Wine manufactured.....gals.	1,072	1,072 00	2,206	2,206 00
Wood marketed.....		5,690 00		4,982 00
Totals.....		\$779,643 64		\$776,693 47

LIVE STOCK.—GEARY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	5,189	\$269,828 00	5,474	\$180,642 00
Mules and asses.....	228	14,136 00	267	11,214 00
Milch cows.....	3,710	74,200 00	3,533	77,726 00
Other cattle.....	13,208	224,536 00	13,783	248,094 00
Sheep.....	580	1,450 00	587	1,467 50
Swine.....	8,623	64,672 50	11,742	82,194 00
Totals.....	31,538	\$648,822 50	35,386	\$601,337 50

Number of dogs in county March 1, 1893, 1,035; March 1, 1894, 1,248.

GOVE COUNTY.

Has an area of 1,080 square miles, and ranks as the 88th county in population. Gove City, lying a little north of the center, is the county seat.

The Union Pacific railroad crosses the extreme northern portion of the county.

The general surface is undulating, with bluffs, rough lands and deep ravines adjacent to the streams. The bottoms on the Smoky Hill river average one-half mile in width, and are dotted here and there with an occasional clump of cottonwood

POPULATION AND VALUATION.—GOVE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,409	2,368	\$736,339	\$40,598	\$38,193	\$314,726	\$1,129,886
Baker twp.....	355	349	\$100,860	\$3,090	\$5,245	\$61,619	\$170,814
Gove city.....		122 }	108,289	8,381	7,309		123,979
Gove twp.....	405	372 }					
Grainfield city.....		83 }	56,739	7,940	12,378	80,695	157,752
Grainfield twp.....	233	98 }					
Grinnell twp.....	526	506	135,522	4,325	4,211	114,344	258,432
Jerome twp.....	236	238	84,482	4,733	4,382		93,597
Larrabee twp.....	253	219	83,613	3,706	1,601		88,920
Lewis twp.....	131	127	65,408	3,580	272		69,260
Payne twp.....	270	254	101,426	4,843	2,795	58,068	167,132

FARM AND CROP STATISTICS.—GOVE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	27,311	3,822	\$1,719 90	28,308	4,528	\$1,901 76
Spring wheat.....bu.	406	112	44 80	138		
Corn.....bu.	10,776	21,552	6,896 64	5,214		
Oats.....bu.	2,165			698		
Rye.....bu.	2,950			3,159	9,477	4,264 65
Barley.....bu.	6,142			3,258	16,290	733 50
Buckwheat.....bu.						
Irish potatoes.....bu.	152	6,080	6,080 00	93	4,650	4,650 00
Sweet potatoes.....bu.				4	40	40 00
Castor beans.....bu.				5	25	25 00
Sorghum.....bu.	4,038		27,847 00	4,339		25,799 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	1,586	634,400	15,860 00	1,156	346,800	8,670 00
Millet and hungarian, tons	699	1,048	4,192 00	1,939	1,939	9,695 00
Milo maize.....tons	80	†	560 00	21	210	94 50
Kaffir corn.....tons	498	†	5,229 00	303	3,030	1,515 00
Jerusalem corn.....tons	247	†	1,482 00	150	1,800	900 00
Timothy.....tons				1		
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	2	* 308	1,848 00	35	† 590	3,540 00
Orchard grass.....tons						
Other tame grasses.....tons	161					
Prairie grass, fenced.....tons	12,082	1,418	4,963 00	5,529	2,400	14,400 00
Totals.....	69,295		\$76,722 34	54,350		\$76,228 41

Wheat on hand March 1, 1893, 16,847 bushels; March 1, 1894, 291 bushels.

Corn on hand March 1, 1893, 17,224 bushels; March 1, 1894, 1,017 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

trees. The Smoky Hill river crosses the southern tier of townships from west to east, and has Plum and Indian creeks as tributaries from the northwest, and a large number of small creeks from the south.

White, pink and buff limestone are abundant along the banks of Hackberry creek and its branches. It is quarried extensively near the post office of Hackberry, 10½ miles from the Union Pacific railway. Gypsum beds are found along the valley of the Smoky Hill, and it is said that mineral paint exists in several localities.

SUMMARY.—GOVE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	69,295	\$76,722 34	54,350	\$76,228 41
Animals slaughtered and sold for slaughter.....		26,835 00		21,518 00
Milk sold.....		18 00		51 00
Poultry and eggs sold.....		6,310 00		4,896 00
Wool clip.....lbs.	1,965	314 40	5,434	706 42
Cheese.....lbs.	1,785	196 35	620	74 40
Butter.....lbs.	66,157	10,585 12	49,320	7,891 20
Garden products marketed.....		1,454 00		9,340 00
Horticultural products.....				
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$122,435 21		\$120,705 43

LIVE STOCK.—GOVE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,452	\$127,504 00	5,474	\$180,642 00
Mules and asses.....	161	9,982 00	267	11,214 00
Milch cows.....	1,349	26,980 00	1,324	29,128 00
Other cattle.....	6,459	109,803 00	6,201	111,619 00
Sheep.....	1,146	2,865 00	1,169	2,922 50
Swine.....	470	3,525 00	476	3,332 00
Totals.....	12,037	\$280,659 00	14,911	\$338,857 50

Number of dogs in county March 1, 1893, 278; March 1, 1894, 359.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 12.

GRAHAM COUNTY.

It is the 80th county in point of population. Was organized in 1880, and has an area of 900 square miles. The town of Hill City, situated near the center, is the county seat.

The Union Pacific, Lincoln & Colorado, a branch of the Union Pacific railroad, crosses the central portion of the county from east to west.

The general surface is a rolling prairie, with bottoms averaging one mile in width on the South Fork of the Solomon river. There are narrow timber belts, averaging 10 rods in width, skirting the banks of the streams, and are composed of the follow-

ing varieties of trees: White and red elm, hackberry, box elder, black walnut, cottonwood, and willow. The South Fork of the Solomon river flows through the center of the county from west to east, having Rock, Sand, Coon and Spring creeks as tributaries from the northwest, and Brush creek from the southwest. There are several small streams that have their headquarters in the southern part of the county,

POPULATION AND VALUATION.—GRAHAM COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	4,383	4,066	\$1,278,793	\$49,808	\$92,176	\$158,232	\$1,579,009
Allodium twp.....	347	358	\$89,160	\$3,435			\$92,595
Bryant twp.....	262	218	120,435	2,652	\$2,560		125,647
Gettysburg twp.....	411	347	120,055	3,570	6,581	\$34,218	164,424
Graham twp.....	312	285	104,123	2,919	395		107,437
Happy twp.....	215	193	141,373	2,568			143,941
Hill City.....	438 }	344 }	67,842	15,491	55,578	19,998	158,909
Hill City twp.....	235 }	226 }					
Indiana twp.....	401	353	94,530	3,038			97,568
Millbrook twp.....	130	142	57,290	2,010	1,482	8,130	68,912
Morian twp.....	343	350	160,280	2,798			163,078
Nicodemus twp.....	328	322	48,049	1,131	1,867		51,047
Pioneer twp.....	364	334	93,925	6,470			100,395
Solomon twp.....	341	355	102,069	2,526		39,606	144,201
Wild Horse twp.....	256	239	79,662	1,200	23,713	56,280	160,855

FARM AND CROP STATISTICS.—GRAHAM COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	19,981			23,444	14,064	\$5,906 88
Spring wheat.....bu.	3,638			2,733		
Corn.....bu.	30,643	214,501	\$68,640 32	31,678	126,712	50,684 80
Oats.....bu.	4,525	18,100	5,430 00	3,104	9,312	3,072 96
Rye.....bu.	6,493	19,479	9,739 50	4,232	25,392	10,664 64
Barley.....bu.	4,535	22,675	10,203 75	1,598	7,990	3,435 70
Buckwheat.....bu.	30			11	88	52 80
Irish potatoes.....bu.	664	13,280	10,624 00	479	2,395	2,395 00
Sweet potatoes.....bu.	8	360	360 00	18	180	180 00
Castor beans.....bu.	10	80	92 00			
Sorghum.....bu.	1,823		10,130 00	1,877		11,022 80
Cotton.....lbs.	10					
Flax.....bu.	20	60	51 00	1		
Tobacco.....lbs.	7			1		
Broom corn.....lbs.	1,031	412,400	10,310 00	1,295	84,175	2,104 38
Millet and hungarian, tons	1,865	2,480	12,400 00	3,278	2,457	12,285 00
Milo maize.....tons	26	78	273 60	53	1,060	477 00
Kafir corn.....tons	248	744	2,604 00	666	13,320	6,660 00
Jerusalem corn.....tons	83	208	624 00	157	4,710	2,355 00
Timothy.....tons	11					
Clover.....tons	2					
Blue grass.....tons	2	* 3,754	22,524 00	3	† 2,238	13,428 00
Alfalfa.....tons	22			57		
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	16,984	6,080	24,320 00	17,479	5,069	20,276 00
Totals.....	92,661		\$188,325 57	92,164		\$145,000 96

Wheat on hand March 1, 1893, 57,020 bushels; March 1, 1894, 14,898 bushels.

Corn on hand March 1, 1893, 188,587 bushels; March 1, 1894, 34,191 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

and are tributaries to the Saline river, in Trego county. Bow creek flows across the northern tier of townships from west to east.

Magnesian limestone abounds in the southern two-thirds of the county, and a very hard limestone is found on Bow creek, in the northern portion. A hard sandstone also exists in the last-named portion. Gypsum is found in small quantities all over the county.

SUMMARY.—GRAHAM COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops .....acres	92,661	\$188,325 57	92,164	\$145,000 90
Animals slaughtered and sold for slaughter.....		99,705 00		156,006 00
Milk sold.....		194 00		110 00
Poultry and eggs sold.....		13,414 00		11,139 00
Wool clip.....lbs.	13,940	2,230 40	17,577	2,285 01
Cheese.....lbs.	5,015	551 65	9,350	1,122 00
Butter.....lbs.	143,308	22,929 28	117,899	18,863 84
Garden products marketed.....		6,544 00		1,726 00
Horticultural products.....		102 00		50 00
Honey and beeswax.....lbs.	22	3 96	40	7 20
Wine manufactured.....gals.	392	392 00	13	13 00
Wood marketed.....		154 00		245 00
Totals.....		\$334,545 86		\$336,568 01

LIVE STOCK.—GRAHAM COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,599	\$187,148 00	3,772	\$124,476 00
Mules and asses.....	255	15,810 00	200	8,400 00
Milch cows.....	2,674	53,480 00	2,452	53,944 00
Other cattle.....	6,832	116,144 00	5,203	93,654 00
Sheep.....	2,577	6,442 50	1,336	3,340 00
Swine.....	5,754	43,155 00	3,800	26,600 00
Totals.....	21,691	\$422,179 50	16,763	\$310,414 00

Number of dogs in county March 1, 1893, 770; March 1, 1894, 825.

Number of sheep killed by wolves, year ending March 1, 1894, 39.

GRANT COUNTY.

In 1887 the legislature created this county, by taking from Hamilton and Finney eight townships each, giving it a territory of 576 square miles. It was organized in 1888, and now ranks as the 104th in point of population. The town of Ulysses, situated in the center, is the county seat.

There are no railroads in the county.

The surface is generally level, and the soil a black loam. Bottom lands average one mile in width. The North Fork of the Cimarron river enters the county two miles north of the southwestern corner, flows in a northeasterly direction until it

reaches the center, then to the southeast over the eastern boundary two miles north of the southeast corner.

Sandstone and limestone are found along the streams, near the surface. Fire clay and gypsum are also found in the same localities. Springs are not numerous, but well water can be obtained at a depth of from 50 to 100 feet.

POPULATION AND VALUATION.—GRANT COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	1,330	771	\$568,380	\$13,139	\$3,991	.....	\$585,510
Howard twp.....	50	27	\$59,410	\$234	.....	.....	\$59,644
Ulysses city.....	87	268	160,100	4,865	\$3,991	.....	168,956
Lincoln twp.....	398	181	92,420	599	.....	.....	93,019
Sheridan twp.....	70	39	112,980	4,270	.....	.....	117,250
Sherman twp.....	319	170	69,500	1,362	.....	.....	70,862
Sullivan twp.....	169	106	73,970	1,809	.....	.....	75,779
Thomas twp.....	324	161					

FARM AND CROP STATISTICS.—GRANT COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	7,564	.....	.....	3,847	3,845	\$1,730 25
Spring wheat.....bu.	189	.....	.....	5	.....	.....
Corn.....bu.	1,989	.....	.....	495	1,980	990 00
Oats.....bu.	923	.....	.....	278	216	62 64
Rye.....bu.	1,559	.....	.....	430	1,720	774 00
Barley.....bu.	1,327	.....	.....	165	2,145	858 00
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	13	.....	.....	7	140	126 00
Sweet potatoes.....bu.	2	.....	.....	2	200	160 00
Castor beans.....bu.	30	90	\$103 50	.....	.....	.....
Sorghum.....bu.	1,687	.....	14,504 00	1,694	.....	9,891 00
Flax.....bu.	.....	106	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	4,696	1,174,000	29,350 00	2,083	520,750	15,622 50
Millet and hungarian.....tons	221	110	330 00	94	69	345 00
Milo maize.....tons	465	1,395	4,882 00	442	5,304	2,386 80
Kaffir corn.....tons	1,150	2,300	8,050 00	1,307	13,070	6,535 00
Jerusalem corn.....tons	1,033	1,550	4,650 00	1,321	19,815	9,907 50
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	.....	.....	.....	.....	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	2,880	628	4,710 00	975	631	3,786 00
Totals.....	25,728	.....	\$66,579 50	13,145	.....	\$53,174 69

Wheat on hand March 1, 1893, 6,823 bushels; March 1, 1894, 40 bushels.

Corn on hand March 1, 1893, 3,138 bushels; March 1, 1894, 10 bushels.

† Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—GRANT COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	25,728	\$66,729 50	13,145	\$53,174 69
Animals slaughtered and sold for slaughter.....		15,274 00		8,796 00
Milk sold.....		45 00		25 00
Poultry and eggs sold.....		2,918 00		1,126 00
Wool clip.....lbs.				
Cheese.....lbs.	220	24 20	350	42 00
Butter.....lbs.	18,349	2,935 84	16,073	2,571 68
Garden products marketed.....		202 00		6 00
Horticultural products.....		20 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$88,148 54		\$65,741 37

LIVE STOCK.—GRANT COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,169	\$60,788 00	940	\$31,020 00
Mules and asses.....	67	4,154 00	57	2,394 00
Milch cows.....	1,124	22,480 00	513	11,286 00
Other cattle.....	2,513	42,721 00	1,383	24,894 00
Sheep.....	24	60 00	41	102 50
Swine.....	574	4,305 00	222	1,554 00
Totals.....	5,471	\$134,508 00	3,156	\$71,250 50

Number of dogs in county March 1, 1893, 210; March 1, 1894, 146.

GRAY COUNTY.

By an act of the legislature in 1887, Gray county was created, from portions of Finney, Ford and Hodgeman counties. It has an area of 864 square miles, and ranks as the 96th county in point of population.

POPULATION AND VALUATION.—GRAY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,050	1,503	\$600,131	\$26,437	\$37,850	\$284,397	\$948,815
Cimarron city.....		375					
Cimarron twp.....	448	125 } 500	\$86,977	\$6,056	\$22,494	\$135,898	\$251,425
Footo twp.....	254	193	82,717	2,009			84,726
Hess twp.....	220	92	91,167	3,935			95,102
Ingalls city.....	149	285	39,833	4,583	12,068	59,355	115,839
Ingalls twp.....	136	211					
Logan twp.....	209		93,904	4,269		89,144	187,317
Montezuma twp.....	266	224	98,923	2,636	3,288		104,847
Richland twp.....	153	125	47,684	769			48,453
Salem twp.....	215	158	58,925	2,180			61,105

The town of Ingalls, situated on the Arkansas river, is the county seat.

The Atchison, Topeka & Santa Fé railroad, following the Arkansas river, crosses the county in a northwesterly direction.

The surface is generally level, the only bottom lands being on the Arkansas river.

A fair quality of sandstone crops out of the bluffs along the Arkansas river which traverses the northern portion of the county in a southeasterly direction.

FARM AND CROP STATISTICS.—GRAY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	22,799	6,837	\$2,939 91	22,438	5,832	\$2,099 52
Spring wheat.....bu.	417			69	40	16 00
Corn.....bu.	2,948			1,612		
Oats.....bu.	1,421			645	320	232 00
Rye.....bu.	1,340			455	455	182 00
Barley.....bu.	4,741			2,135		
Buckwheat.....bu.						
Irish potatoes.....bu.	45			45	1,800	1,620 00
Sweet potatoes.....bu.	5			6	240	240 00
Castor beans.....bu.						
Sorghum.....bu.	2,187		19,240 00	3,057		18,640 00
Flax.....bu.	52	104	88 40	7		
Tobacco.....lbs.						
Broom corn.....lbs.	210	63,000	2,175 00	62		
Millet and hungarian.....tons	484	242	726 00	344	258	1,290 00
Milo maize.....tons	74	† 148	518 00	29	290	130 50
Kaffir corn.....tons	1,263	‡ 2,526	8,839 00	1,341	13,410	6,705 00
Jerusalem corn.....tons	53	† 80	240 00	115	1,150	575 00
Timothy.....tons						
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	1,171	* 2,180	13,080 00	893	† 648	3,888 00
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	4,393	2,331	9,324 00	4,093	1,322	5,288 00
Totals.....	43,603		\$57,170 31	37,346		\$40,906 02

Wheat on hand March 1, 1893, 11,453 bushels; March 1, 1894, 583 bushels.

Corn on hand March 1, 1893, 525 bushels; March 1, 1894, 202 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—GRAY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	43,603	\$57,170 31	37,346	\$40,906 02
Animals slaughtered and sold for slaughter.....		11,888 00		15,193 00
Milk sold.....		125 00		20 00
Poultry and eggs sold.....		4,545 00		3,131 00
Wool clip.....lbs.				
Cheese.....lbs.	1,815	199 65	1,500	180 00
Butter.....lbs.	49,425	7,908 00	42,834	6,853 44
Garden products marketed.....		255 00		338 00
Horticultural products.....				
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$82,090 96		\$66,621 46

LIVE STOCK.—GRAY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,521	\$79,092 00	1,448	\$47,784 00
Mules and asses.....	194	12,028 00	189	7,938 00
Milch cows.....	1,186	23,720 00	968	21,296 00
Other cattle.....	3,220	54,740 00	1,769	31,842 00
Sheep.....	.....	.....	25	62 50
Swine.....	420	3,150 00	375	2,625 00
Totals.....	6,541	\$172,730 00	4,774	\$111,547 50

Number of dogs in county March 1, 1893, 328; March 1, 1894, 285.

GREELEY COUNTY.

Was organized in 1888, with an area of 780 square miles, and is the 97th county in point of population. The town of Tribune, situated near the center, is the county seat. Whitelaw, Horace and Astor are other railroad towns in the county.

The Denver, Memphis & Atlantic railroad, a portion of the Missouri Pacific system, crosses the county through the central portion from east to west.

The general surface is level, sloping gently from the northwest to southeast.

An inferior quality of sandstone is found in the northern portion, and magnesian limestone in the northwestern. Gypsum exists in all sections of the county.

FARM AND CROP STATISTICS.—GREELEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	15,860	.....	.....	14,132	8,478	\$3,815 10
Spring wheat.....bu.	1,399	.....	.....	1,115	1,503	601 20
Corn.....bu.	7,294	.....	.....	3,899	11,697	5,848 50
Oats.....bu.	1,103	11,030	\$3,309 00	1,118	2,680	938 00
Rye.....bu.	1,385	.....	.....	476	.....	.....
Barley.....bu.	2,251	.....	.....	1,514	.....	.....
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	102	.....	.....	65	2,600	2,340 00
Sweet potatoes.....bu.	.....	.....	.....	.....	.....	.....
Castor beans.....bu.	20	60	69 00	.....	.....	.....
Sorghum.....bu.	1,578	.....	13,880 00	1,850	.....	11,285 00
Flax.....bu.	.....	.....	.....	28	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	3,460	865,000	21,625 00	3,331	.....	.....
Millet and hungarian, tons	424	212	1,060 00	507	378	1,890 00
Milo maize.....tons	229	† 687	2,404 00	276	2,760	1,242 00
Kaffir corn.....tons	138	† 276	966 00	256	2,560	1,280 00
Jerusalem corn.....tons	722	† 1,083	3,249 00	804	8,040	4,020 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	2	.....	.....	.....	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	365	.....	.....	730	36	144 00
Totals.....	36,332	.....	\$46,562 00	30,101	.....	\$23,403 80

Wheat on hand March 1, 1893, 5,386 bushels; March 1, 1894, 310 bushels.

Corn on hand March 1, 1893, 3,143 bushels; March 1, 1894, 160 bushels.

† Product estimated in tons for 1893; in bushels for 1894.

POPULATION AND VALUATION.—GREELEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	1,345	1,321	\$684,030	\$35,508	\$50,394	\$175,036	\$944,968
Colony twp.....	507	516	\$294,785	\$7,145	\$2,834	\$66,823	\$371,587
Harrison twp.....	214	191	180,790	2,332	.....	49,109	232,231
Tribune city.....	101 }	75 }					
Horace city.....	106 }	119 }					
Tribune twp.....	417 }	420 }	208,455	26,031	47,560	59,104	341,150

SUMMARY.—GREELEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	36,332	\$46,562 00	30,101	\$23,445 80
Animals slaughtered and sold for slaughter.....		7,430 00		7,149 00
Milk sold.....		78 00		92 00
Poultry and eggs sold.....		3,339 00		1,944 00
Wool clip.....lbs.	1,205	192 80		.....
Cheese.....lbs.	900	99 00	675	81 00
Butter.....lbs.	21,203	3,392 48	19,270	3,083 20
Garden products marketed.....		75 00		.....
Horticultural products.....		.....		.....
Honey and beeswax.....lbs.		.....		.....
Wine manufactured.....gals.		.....		.....
Wood marketed.....		.....		.....
Totals.....		\$61,168 28		\$35,795 00

LIVE STOCK.—GREELEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,141	\$59,332 00	998	\$32,934 00
Mules and asses.....	110	6,820 00	102	4,284 00
Milch cows.....	642	12,840 00	579	12,738 00
Other cattle.....	1,655	17,935 00	774	13,932 00
Sheep.....	2,302	5,755 00	920	2,300 00
Swine.....	418	3,135 00	201	1,407 00
Totals.....	5,668	\$105,817 00	3,574	\$67,595 00

Number of dogs in county March 1, 1893, 156; March 1, 1894, 177.

GREENWOOD COUNTY.

It was organized in 1862. It has an area of 1,155 square miles, and ranks as the 40th in population. Its county seat is Eureka, lying south and west of the center four miles. The towns of Fall River, Madison and Severy transact a large local business. There are several smaller towns in the county.

The Kansas City, Emporia & Southern, and the Chicago, Kansas & Western, members of the Atchison, Topeka & Santa Fé; Interstate; Fort Scott, Wichita & Western, of the Missouri Pacific system; and the St. Louis, Wichita & Western, a branch of the St. Louis & San Francisco, afford abundant railroad facilities.

The general surface is an undulating prairie, with bluffs and rough lands on either side of the streams. Of the county area, 10 per cent. is in bottom land, the valleys averaging from one-half to one mile in width. Timber belts are from 40 to 80 rods wide, and contain the following varieties of trees: Hickory, bur oak, Spanish oak, walnut, maple, elm, box elder, mulberry, black ash, and locust. Springs are found everywhere in the county, and well water is reached at an average depth of 22 feet. The county is well supplied with creeks and rivers, the Verdigris and Fall rivers being the principal streams.

Blue limestone is found in the northern, sandstone in the southern and magnesian limestone in the western portions. A quarry of variegated marble of excellent quality has lately been discovered 16 miles northwest of Eureka. Deposits of mineral paint, cement and fire clay are found in the same locality. Specimens of these have been subjected to the severest tests, and have received the highest testimonials. Coal is found in several places in the central portion.

POPULATION AND VALUATION.—GREENWOOD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	14,704	15,090	\$2,025,811	\$773,563	\$318,719	\$886,110	\$4,004,203
Bachelor twp.	588	621	\$133,665	\$43,332	\$525	\$91,223	\$268,745
Eureka city.	2,111 } 2,720	2,140 } 2,807	153,133	143,259	199,855	72,598	568,845
Eureka twp.	609	667					
Fall River twp.	950	973	113,429	40,511	1,620	31,733	187,293
Janesville twp.	1,267	1,373	282,592	79,854	10,474	61,558	434,478
Lane twp.	695	726	101,692	32,702	2,162	44,337	180,893
Madison city.	553 } 1,494	543 } 1,507	236,944	94,700	37,147	81,709	450,500
Madison twp.	941	964					
Otter Creek twp.	1,127	1,078	142,024	58,295	4,850	97,542	302,711
Pleasant Grove twp. .	548	603	117,186	33,560		45,695	196,441
Quincy twp.	878	904	123,218	34,840	5,453	60,225	223,736
Salem twp.	261	284	92,944	20,258			113,202
Fall River city.	441 } 1,313	441 } 1,340	138,397	41,893	26,806	60,446	267,542
Salt Springs twp.	872	899					
Shell Rock twp.	608	621	91,387	36,646	420	42,078	170,531
South Salem twp.	590	607	119,665	61,170			180,835
Spring Creek twp.	501	461	77,451	15,360	3,261	67,193	163,265
Severy city.	371 } 1,164	371 } 1,185	102,084	37,183	26,146	129,773	295,186
Twin Groves twp.	793	814					

FARM AND CROP STATISTICS.—GREENWOOD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	6,445	67,860	\$29,179 80	4,789	53,634	\$23,062 62
Spring wheat.....bu.	5					
Corn.....bu.	90,885	2,090,355	627,106 50	111,084	1,110,840	444,336 00
Oats.....bu.	21,768	391,824	86,201 28	15,610	111,672	36,851 76
Rye.....bu.	269	4,304	2,152 00	175	2,100	882 00
Barley.....bu.	10	240	96 00	77	770	308 00
Buckwheat.....bu.	76	608	456 00	12	96	57 60
Irish potatoes.....bu.	771	46,260	42,559 20	879	45,708	34,281 00
Sweet potatoes.....bu.	31	2,325	2,325 00	20	1,400	1,218 00
Castor beans.....bu.				6	60	60 00
Sorghum.....bu.	4,033		16,132 00	4,388		52,635 00
Flax.....bu.	3,015	15,075	12,813 75	3,062	24,496	24,496 00
Tobacco.....lbs.						
Broom corn.....lbs.	35	17,500	525 00			
Millet and hungarian, tons	5,586	11,172	33,516 00	6,588	9,882	39,528 00
Milo maize.....tons	30	†	420 00	90	1,800	810 00
Kaffir corn.....tons	1,627	†	22,778 00	4,801	144,030	72,015 00
Jerusalem corn.....tons	69	†	414 00	13	260	130 00
Timothy.....tons	1,136	* 3,325	19,950 00	1,164	† 4,929	29,574 00
Clover.....tons	2,132			1,309		
Blue grass.....tons	3,664			5,135		
Alfalfa.....tons	601			862		
Orchard grass.....tons	164			157		
Other tame grasses.....tons	861			744		
Prairie grass, fenced.....tons	168,486	48,536	145,608 00	133,422	57,248	171,744 00
Totals.....	311,699		\$1,042,232 53	294,287		\$931,988 98

Wheat on hand March 1, 1893, 2,878 bushels; March 1, 1894, 16,223 bushels.

Corn on hand March 1, 1893, 362,136 bushels; March 1, 1894, 283,158 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—GREENWOOD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	311,699	\$1,042,232 53	294,287	\$931,988 98
Animals slaughtered and sold for slaughter.....		1,287,224 00		1,448,187 00
Milk sold.....		684 00		1,055 00
Poultry and eggs sold.....		37,561 00		41,420 00
Wool clip.....lbs.	21,696	3,471 36	12,448	1,618 24
Cheese.....lbs.	2,605	286 55	2,962	355 44
Butter.....lbs.	311,372	49,819 52	432,306	69,168 96
Garden products marketed.....		5,724 00		7,460 00
Horticultural products.....		3,124 00		1,982 00
Honey and beeswax.....lbs.	4,617	831 34	1,971	256 72
Wine manufactured.....gals.	2,469	2,469 00	1,866	1,866 00
Wood marketed.....		1,562 00		1,658 00
Totals.....		\$2,434,989 30		\$2,507,116 34

LIVE STOCK.—GREENWOOD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,609	\$603,668 00	12,269	\$404,877 00
Mules and asses.....	1,469	91,078 00	2,084	87,528 00
Milch cows.....	6,764	135,280 00	7,727	169,994 00
Other cattle.....	44,110	749,870 00	40,931	736,758 00
Sheep.....	5,122	12,805 00	1,235	3,087 50
Swine.....	21,749	163,117 50	31,457	220,199 00
Totals.....	98,823	\$1,755,818 50	95,703	\$1,622,443 50

Number of dogs in county March 1, 1893, 1,959; March 1, 1894, 1,958.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 22.

HAMILTON COUNTY.

Was organized in 1886, with an area of 2,364 square miles, but, by an act of the legislature in 1887, portions were taken from it to assist in creating the new counties of Grant, Kearny, and Stanton, reducing its area to 972 square miles. Ranks as the 92d in population. The town of Syracuse, very near the center, is the county seat. Kendall, Mayline, Medway and Coolidge are also railroad towns.

POPULATION AND VALUATION.—HAMILTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county...	1,807	1,735	\$765,166	\$46,355	\$64,191	\$339,282	\$1,214,994
Bear Creek twp.	142	122	\$131,926	\$2,610	.....	.....	\$134,536
Coolidge city.....	138 } 291	235 } 331	83,101	9,554	\$11,239	\$90,298	194,192
Coolidge twp.	153 }	96 }	.....	.....	.....	.....	.....
Kendall city.....	.....	42 }	81,082	3,111	4,407	71,080	159,680
Kendall twp.	131 }	98 }	.....	.....	.....	.....	.....
Lamont twp.	125	108	110,724	2,872	.....	.....	113,596
Liberty twp.	148	121	76,426	1,852	.....	.....	78,278
Midway twp.	272	209	83,862	6,046	563	70,029	160,500
Richland twp.	162	113	118,101	1,067	.....	.....	119,168
Syracuse city.....	.....	469 }	79,944	19,243	47,982	107,875	255,044
Syracuse twp.	536 }	122 }	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—HAMILTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	12,319	.....	.....	9,012	18,020	\$8,109 00
Spring wheat.....bu.	957	.....	.....	572	225	90 00
Corn.....bu.	1,812	.....	.....	1,265	.....	.....
Oats.....bu.	2,294	.....	.....	2,388	4,293	1,287 90
Rye.....bu.	687	.....	.....	352	352	140 80
Barley.....bu.	1,440	.....	.....	380	380	171 00
Buckwheat.....bu.	2	.....	.....	10	80	48 00
Irish potatoes.....bu.	95	.....	.....	29	1,160	1,044 00
Sweet potatoes.....bu.	31	2,325	\$2,325 00	18	900	900 00
Castor beans.....bu.	1	3	3 45	.....	.....	.....
Sorghum.....bu.	2,773	.....	17,016 00	2,844	.....	14,640 00
Flax.....bu.	7	14	11 90	12	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	2,868	1,434,000	35,850 00	1,291	64,550	1,936 50
Millet and hungarian.tons	122	61	183 00	183	138	690 00
Milo maize.....tons	645	1,935	6,763 00	293	2,344	1,054 80
Kaffir corn.....tons	497	994	3,479 00	855	8,550	4,275 00
Jerusalem corn.....tons	1,584	3,168	9,504 00	1,853	14,824	7,412 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	1	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	1,390	* 2,588	15,528 00	1,593	† 3,086	18,516 00
Orchard grass.....tons	3	.....	.....	.....	.....	.....
Other tame grasses.....tons	125	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	7,485	2,677	10,708 00	6,038	2,294	9,176 00
Totals.....	37,138	.....	\$101,371 35	28,988	.....	\$69,491 00

Wheat on hand March 1, 1893, 4,528 bushels; March 1, 1894, 50 bushels.

Corn on hand March 1, 1893, 637 bushels; March 1, 1894, 40 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The main line of the Atchison, Topeka & Santa Fé railroad crosses the central portion of the county, in a northwesterly direction. Bottom lands are from two to four miles wide along the Arkansas river, but the timber is confined to a few specimens of cottonwood along the valleys of the streams. The Arkansas river, having a few small tributaries from the north, enters the county over the Colorado border 16½ miles south of the northwestern corner. The northern portion of the county is generally level; the southern a rolling prairie.

Artificial groves, containing maple, mulberry, locust, catalpa and other varieties of trees have been planted in several portions of the county, and are in a flourishing condition.

White magnesian limestone is found in large quantities in the bluffs along the entire course of the Arkansas river. Gypsum, in large quantities, is found along the draws running back from the Arkansas river. There are indications of coal in the northern portion of the county.

SUMMARY.—HAMILTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	37,138	\$101,371 35	28,988	\$69,491 00
Animals slaughtered and sold for slaughter.....		49,250 00		36,182 00
Milk sold.....		448 00		3,837 00
Poultry and eggs sold.....		3,492 00		3,049 00
Wool clip.....lbs.	8,120	1,299 20	1,287	167 31
Cheese.....lbs.	100	11 00	325	39 00
Butter.....lbs.	34,390	5,502 40	77,195	12,351 20
Garden products marketed.....		768 00		429 00
Horticultural products.....		1,280 00		1,035 00
Honey and beeswax.....lbs.			1,050	190 00
Wine manufactured.....gals.				
Wood marketed.....				6 00
Totals.....		\$163,421 95		\$126,776 51

LIVE STOCK.—HAMILTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,416	\$73,632 00	1,491	\$49,203 00
Mules and asses.....	118	7,316 00	89	3,738 00
Milch cows.....	893	17,860 00	1,054	23,188 00
Other cattle.....	5,001	85,017 00	3,767	67,806 00
Sheep.....	245	612 50	1,400	3,500 00
Swine.....	692	5,190 00	530	3,710 00
Totals.....	8,365	\$189,627 50	8,331	\$151,145 00

Number of dogs in county March 1, 1893, 240; March 1, 1894, 239.

Number of sheep killed by wolves, year ending March 1, 1894, 20.

HARPER COUNTY.

It was organized in 1873, and for want of population was afterward disorganized. In 1878 was again organized, with a territory of 810 square miles, and ranks as the 56th county in population. The city of Anthony, situated a little south and east of the center, is the county seat. Harper, in the north-central portion, and Attica, in the northwestern, are places of much importance, having a large local trade. There are several smaller towns in the county.

The lines of railroad are: The Southern Kansas and its Harper & Western division, operated by the Atchison, Topeka & Santa Fé; Fort Scott, Wichita & Western, a member of the Missouri Pacific; St. Louis, Kansas & Southwestern, of the St. Louis & San Francisco, and the Hutchinson & Southern.

The general surface is slightly rolling, with long, gentle slopes. Bottom lands, averaging one mile in width, comprise about 15 per cent. of the county area. There is very little timber in the county, the few trees found on the banks of streams being mostly cottonwood. Springs are plentiful, and good well water is found at an average depth of 15 feet. The county is well supplied with streams, all having a general course to the southeast.

A red sandstone, excellent for building purposes, is found in all portions of the county. It is quite soft when first quarried, but hardens rapidly when exposed to the atmosphere. A large deposit of what is claimed to be mineral paint is found in the southeastern portion, but its value has not yet been tested. A good quality of brick is made from clay found in the county.

POPULATION AND VALUATION.—HARPER COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	14,486	10,452	\$1,491,047	\$193,302	\$368,111	\$615,694	\$2,668,154
Anthony city.....	2,404 } 3,266	1,686 } 2,322	\$129,965	\$65,429	\$171,256	\$108,026	\$474,676
Anthony twp.....	862 }	636 }					
Harper city.....	1,764 } 2,242	1,306 } 1,694	66,215	32,527	131,409	70,797	300,948
Banner twp.....	478 }	388 }					
Berlin twp.....	297	221	70,555	5,055		21,448	97,058
Blaine twp.....	542	256	80,200	6,260	633	26,038	113,131
Chicaskia twp.....	382	347	60,070	8,120			63,190
Eagle twp.....	309	171	92,900	3,896	307	27,871	124,974
Empire twp.....	300	144	60,685	4,439			65,124
Garden twp.....	284	224	59,625	1,870			61,495
Grant twp.....	432	425	63,450	2,265		26,960	92,675
Green twp.....	298	172	59,360	2,053	1,336	37,929	100,678
Harper twp.....	569	444	70,631	3,875	239		74,745
Lake twp.....	502	322	91,225	4,330	1,416	14,489	111,460
Lawn twp.....	414	346	66,470	2,210		45,749	114,429
Odell twp.....	658	565	73,210	10,664	4,396	58,572	146,842
Pilot Knob twp.....	527	412	71,156	2,730		41,441	115,327
Attica city.....	613 }	290 }					
Ruella twp.....	272 }	212 }	33,050	10,972	34,990	29,821	108,833
Freeport city.....	146 }	75 }					
Silver Creek twp.....	508 }	391 }	74,325	4,079	5,575	23,218	107,197
Spring twp.....	607	398	114,175	9,118	2,495	30,129	155,917
Bluff City.....	325 }	182 }					
Stohrville twp.....	993 }	839 }	153,780	13,410	14,059	53,206	234,455

FARM AND CROP STATISTICS.—HARPER COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	151,557	1,159,407	\$521,733 15	143,114	991,771	\$376,872 98
Spring wheat.....bu.	3			20		
Corn.....bu.	43,441	217,205	76,021 75	50,108		
Oats.....bu.	26,757	401,355	112,379 40	19,440	75,810	21,984 90
Rye.....bu.	277	2,770	1,108 00	153	1,530	612 00
Barley.....bu.	780			181	4,525	1,900 50
Buckwheat.....bu.						
Irish potatoes.....bu.	564	19,740	19,740 00	283	11,320	10,188 00
Sweet potatoes.....bu.	40	8,000	3,000 00	11	550	495 00
Castor beans.....bu.						
Sorghum.....bu.	379		10,416 00	366		9,714 00
Cotton.....lbs.				1	200	12 00
Flax.....bu.	8	32	27 20			
Tobacco.....lbs.	1					
Broom corn.....lbs.	20	8,000	240 00	135		
Millet and hungarian, tons	2,491	2,491	9,964 00	1,098	1,098	5,490 00
Milo maize.....tons	43	129	451 00	167	1,670	751 50
Kaffir corn.....tons	426	1,278	4,473 00	1,305	13,050	6,525 00
Jerusalem corn.....tons	39	78	234 00	31	310	155 00
Timothy.....tons	30					
Clover.....tons	9			7		
Blue grass.....tons	14			23		
Alfalfa.....tons	495	* 1,355	8,130 00	952	† 63	378 00
Orchard grass.....tons	150					
Other tame grasses.....tons	19					
Prairie grass, fenced..tons	91,393	9,502	47,510 00	56,873	2,523	10,092 00
Totals.....	318,936		\$815,427 50	274,268		\$445,170 88

Wheat on hand March 1, 1893, 159,633 bushels; March 1, 1894, 65,946 bushels.

Corn on hand March 1, 1893, 182,136 bushels; March 1, 1894, 16,147 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—HARPER COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	318,936	\$815,427 50	274,268	\$445,170 88
Animals slaughtered and sold for slaughter.....		383,005 00		223,198 00
Milk sold.....		2,111 00		2,150 00
Poultry and eggs sold.....		24,167 00		17,804 00
Wool clip.....lbs.	945	151 20		
Cheese.....lbs.	1,587	174 57	1,370	164 40
Butter.....lbs.	237,343	37,974 88	216,115	34,578 40
Garden products marketed.....		13,977 00		3,615 00
Horticultural products.....		6,925 00		1,801 00
Honey and beeswax.....lbs.	25	4 50		
Wine manufactured.....gals.	611	611 00	680	680 00
Wood marketed.....		51 00		17 00
Totals.....		\$1,284,579 65		\$731,178 68

LIVE STOCK.—HARPER COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	8,826	\$458,952 00	8,007	\$264,231 00
Mules and asses.....	1,390	86,180 00	1,172	49,224 00
Milch cows.....	5,377	107,540 00	3,814	83,908 00
Other cattle.....	13,389	227,613 00	7,016	126,288 00
Sheep.....	92	230 00	29	72 50
Swine.....	9,830	73,725 00	6,586	46,102 00
Totals.....	38,904	\$954,240 00	26,624	\$569,825 50

Number of dogs in county March 1, 1893, 1,505; March 1, 1894, 1,276.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 1.

HARVEY COUNTY.

Was organized in 1872; has an area of 540 square miles, and ranks as the 31st in point of population. The city of Newton, in the east-central portion, is the county seat. Halstead, in the southwestern portion, is a thriving place, doing considerable business with the surrounding country. There are several small towns of much importance in their respective localities.

The following lines of railroad afford ample facilities for travel in the county: The Atchison, Topeka & Santa Fé, and its branch, the Wichita & Southwestern; Fort Scott, Wichita & Western, of the Missouri Pacific; the Kansas Midland, of the St. Louis & San Francisco; and the Chicago, Rock Island & Pacific.

The general surface is a level prairie, rolling in the southeastern portion, and sand hills in the northwestern corner. Bottom lands average from one-fourth to three-fourth of a mile in width, and comprise, in the aggregate, about 30 per cent.

Timber belts on the streams average from 10 rods to one-fourth of a mile in width, and contain the following varieties of trees: Walnut, elm, hackberry, cottonwood, ash, box elder, mulberry, and sycamore.

Magnesian limestone, in small quantities and of an inferior quality, is found in the northeastern portion of the county. A good quality of brick is manufactured from a bed of clay near the city of Newton. The eastern half of the county seems to be underlaid with gypsum, especially along Doyle creek and the west branch of the White Water. Borings in Darlington and Newton townships have developed large bodies of salt water at a depth of from 500 to 700 feet.

The Little Arkansas river enters the county on the northwest and flows southeast, crossing the southern boundary at about the center.

POPULATION AND VALUATION.—HARVEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	16,613	16,600	\$1,710,886	\$450,900	\$1,062,944	\$829,280	\$4,054,020
Alta twp.	632	606	\$97,430	\$15,675	.....	.....	\$113,105
Burrton city.	578 } 913	620 } 978	79,654	18,325	\$43,577	\$124,368	265,924
Burrton twp.	335 }	358 }	110,223	12,414	133	160	122,930
Darlington twp.	575	536	118,400	16,054	5,113	37,889	177,456
Hesston city.	85 }	90 }	113,434	16,897	.....	.....	130,331
Emma twp.	652 }	648 }	128,693	60,997	49,892	86,163	325,745
Garden twp.	683	683	95,502	10,024	.....	26,633	132,159
Halstead city.	719 }	734 }	83,076	14,319	1,175	69,876	158,446
Halstead twp.	552 }	622 }	93,450	7,859	5,054	2,423	108,786
Highland twp.	582	548	147,733	16,618	306	74,506	239,163
Lake twp.	453	476	.....	.....	.....	.....	.....
Lakin twp.	862	817	.....	.....	.....	.....	.....
Macon twp.	664	609	.....	.....	.....	.....	.....
Newton city.	5,496 }	5,529 }	177,385	190,797	886,819	185,641	1,440,642
Newton twp.	605 }	677 }	110,998	5,624	336	431	117,389
Pleasant twp.	703	639	118,087	10,867	1,788	55,130	185,872
Richland twp.	488	500	.....	.....	.....	.....	.....
Sedgwick city.	602 }	652 }	133,557	36,998	56,450	75,341	302,346
Sedgwick twp.	556 }	517 }	103,264	17,442	12,301	100,719	233,726
Walton city.	220 }	213 }	.....	.....	.....	.....	.....
Walton twp.	571 }	526 }	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—HARVEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	70,587	656,450	\$295,402 50	71,804	376,971	\$147,018 69
Spring wheat.....bu.	10			16		
Corn.....bu.	64,541	968,115	290,434 50	63,675	764,100	267,435 00
Oats.....bu.	26,492	450,381	117,099 06	25,479	278,222	83,466 60
Rye.....bu.	900	14,400	4,472 00	1,300	11,700	4,329 00
Barley.....bu.	44			85	340	136 00
Buckwheat.....bu.	4	24	18 00	4	32	19 20
Irish potatoes.....bu.	635	27,940	25,146 00	644	30,912	26,584 32
Sweet potatoes.....bu.	8	400	400 00	19	1,824	1,605 12
Castor beans.....bu.						
Sorghum.....bu.	1,386		9,207 00	2,958		28,356 00
Flax.....bu.	160	800	680 00	34	306	306 00
Tobacco.....lbs.						
Broom corn.....lbs.	20	8,000	240 00	45	18,000	540 00
Millet and hungarian, tons	955	1,671	8,355 00	2,011	3,017	15,085 00
Milo maize.....tons				2	† 30	13 50
Kaffir corn.....tons	219	‡ 438	1,533 00	258	5,160	2,580 00
Jerusalem corn.....tons				3	‡ 45	22 50
Timothy.....tons	1,382			783		
Clover.....tons	541			115		
Blue grass.....tons	549			402		
Alfalfa.....tons	1,011	* 1,471	8,826 00	1,053	† 1,010	6,060 00
Orchard grass.....tons	116			102		
Other tame grasses.....tons	118			40		
Prairie grass, fenced.....tons	75,856	26,364	145,002 00	76,059	12,427	37,281 00
Totals.....	245,535		\$906,815 06	246,891		\$620,837 93

Wheat on hand March 1, 1893, 322,321 bushels; March 1, 1894, 212,543 bushels.

Corn on hand March 1, 1893, 369,463 bushels; March 1, 1894, 88,746 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—HARVEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	245,535	\$906,815 06	246,891	\$620,837 93
Animals slaughtered and sold for slaughter.....		399,495 00		402,688 00
Milk sold.....		8,371 00		6,829 00
Poultry and eggs sold.....		50,745 00		40,590 00
Wool clip.....lbs.	18,463	2,954 08	15,955	2,074 15
Cheese.....lbs.	11,288	1,241 68	3,193	383 16
Butter.....lbs.	326,354	52,216 64	273,090	43,694 40
Garden products marketed.....		7,459 00		3,884 00
Horticultural products.....		4,474 00		4,195 00
Honey and beeswax.....lbs.	690	124 20	247	44 68
Wine manufactured.....gals.	10,128	10,128 00	3,832	3,832 00
Wood marketed.....		130 00		716 00
Totals.....		\$1,444,153 66		\$1,129,768 32

LIVE STOCK.—HARVEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,824	\$562,848 00	10,363	\$341,979 00
Mules and asses.....	887	54,994 00	842	35,364 00
Milch cows.....	7,471	149,420 00	7,611	167,442 00
Other cattle.....	14,952	254,184 00	12,242	220,356 00
Sheep.....	3,215	8,037 50	2,046	5,115 00
Swine.....	18,860	141,450 00	17,379	121,653 00
Totals.....	56,209	\$1,170,933 50	50,483	\$891,909 00

Number of dogs in county March 1, 1893, 2,023; March 1, 1894, 1,877.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 38.

HASKELL COUNTY.

By an act of the legislature in 1887, it was created from a portion of the south half of Finney county. It has an area of 576 square miles, and ranks as the 100th in point of population in the state. Santa Fé, situated in the center, is the county seat.

There are no railroads in the county. The general surface is level or gently rolling, although the southern portion is somewhat broken where coursed by the Cimarron river.

POPULATION AND VALUATION.—HASKELL COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	1,015	831	\$383,385	\$11,290	\$10,281	.....	\$404,956
Arapahoe twp.....	75	57	\$32,000	\$1,141	.....	.....	\$33,141
Boone twp.....	67	72	44,500	691	.....	.....	45,191
Dudley twp.....	71	63	41,000	1,079	.....	.....	42,079
Example twp.....	116	92	44,675	1,559	.....	.....	46,234
Haskell twp.....	268	193	52,235	2,757	\$9,785	.....	64,777
Ivanhoe twp.....	143	124	44,755	1,706	378	.....	46,839
Lockport twp.....	136	118	45,420	1,748	118	.....	47,286
Loco twp.....	79	48	43,300	297	.....	.....	43,597
Review twp.....	60	64	35,500	312	.....	.....	35,812

FARM AND CROP STATISTICS.—HASKELL COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	16,745	9,042	\$4,159 32	16,645	996	\$448 20
Spring wheat.....bu.	237	.....	.....	36	.....	.....
Corn.....bu.	1,987	5,961	2,682 45	1,792	17,920	9,856 00
Oats.....bu.	2,982	29,820	8,946 00	1,186	1,660	498 00
Rye.....bu.	825	3,300	1,584 00	899	2,697	1,159 71
Barley.....bu.	3,142	18,852	9,048 96	1,246	6,230	2,803 50
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	26	.....	.....	11	110	110 00
Sweet potatoes.....bu.	1	.....	.....	5	125	125 00
Castor beans.....bu.	3	9	10 35	.....	.....	.....
Sorghum.....bu.	2,302	.....	16,505 00	2,303	.....	17,840 00
Flax.....bu.	80	160	136 00	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	969	339,150	8,478 75	418	146,300	2,926 00
Millet and hungarian, tons	728	728	3,640 00	224	112	560 00
Milo maize.....tons	247	494	1,729 00	81	1,620	729 00
Kafir corn.....tons	2,005	4,010	14,085 00	1,745	52,350	26,175 00
Jerusalem corn.....tons	259	389	1,167 00	406	8,120	4,060 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....ons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	349	2,094 00	5	.....	.....
Alfalfa.....tons	.....	.....	.....	.....	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	203	.....	.....	.....	.....	.....
Prairie grass, fenced...tons	1,185	703	3,515 00	3,632	188	376 00
Totals.....	33,926	.....	\$77,730 83	30,634	.....	\$67,666 41

Wheat on hand March 1, 1893, 25,165 bushels; March 1, 1894, 1,251 bushels.

Corn on hand March 1, 1893, 2,547 bushels; March 1, 1894, 152 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

There are not many springs, but sheet well water is reached at a depth of from 50 to 100 feet.

SUMMARY.—HASKELL COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	33,926	\$77,730 83	30,634	\$67,666 41
Animals slaughtered and sold for slaughter.....		7,198 00		7,087 00
Milk sold.....		190 00		6 00
Poultry and eggs sold.....		2,419 00		1,805 00
Wool clip.....lbs.				
Cheese.....lbs.				
Butter.....lbs.	27,836	4,453 76	23,128	3,700 48
Garden products marketed.....		61 00		21 00
Horticultural products.....		11 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$92,063 59		\$80,285 89

LIVE STOCK.—HASKELL COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	924	\$48,048 00	835	\$27,555 00
Mules and asses.....	122	7,564 00	103	4,326 00
Milch cows.....	440	8,800 00	385	8,470 00
Other cattle.....	1,053	17,901 00	579	10,422 00
Sheep.....	22	55 00		
Swine.....	371	2,782 50	231	1,617 00
Totals.....	2,932	\$85,150 50	2,133	\$52,390 00

Number of dogs in county March 1, 1893, 197; March 1, 1894, 116.

HODGEMAN COUNTY.

Was organized in 1879, with a territory of 864 square miles; but in 1883 the state legislature added eight townships of Lane and Gray counties on the west, raising the area to 1,152 square miles; and in 1887 eight townships on the west were detached by the legislature to form portions of Garfield and Gray counties, thus restoring the area of 1879. It ranks as the 89th county in the state in population. The town of Jetmore, in the center, is the county seat.

The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé, is the only railroad in the county.

The general surface is undulating prairie. Springs are very scarce, but well water is reached at a depth of 35 feet. The Pawnee river is the principal stream. Bottom lands average three-fourths of a mile in width, and comprise about 10 per cent. of the total area. Ash, cottonwood, hackberry, box elder and china wood are the principal varieties of timber found along the streams.

A good quality of sandstone and limestone, suitable for building purposes and making of fence posts, is found along the Pawnee river and smaller streams. Gypsum in small quantities is found in the central portion of the county.

POPULATION AND VALUATION.—HODGEMAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,462	2,172	\$1,094,106	\$28,668	\$64,810	\$102,112	\$1,289,696
Benton twp.....	86	70	\$35,852	\$931	.....	.....	\$36,783
Jetmore city.....	328 } 663	285 } 600	194,369	8,458	\$64,810	\$38,623	306,260
Center twp.....	335 }	315 }	78,320	694	.....	.....	79,014
Hallet twp.....	123	128	198,498	9,288	.....	63,489	271,275
Marena twp.....	520	482	107,032	2,852	.....	.....	109,884
North Roscoe twp.....	210	155	92,978	1,839	.....	.....	94,817
Sawlog twp.....	172	117	86,939	613	.....	.....	87,552
South Roscoe twp.....	128	114	207,129	2,590	.....	.....	209,719
Sterling twp.....	355	364	92,989	1,403	.....	.....	94,392
Valley twp.....	205	152	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—HODGEMAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	27,253	.....	.....	29,785	5,956	\$2,263 28
Spring wheat.....bu.	76	.....	.....	25	.....	.....
Corn.....bu.	2,421	.....	.....	3,385	.....	.....
Oats.....bu.	2,846	.....	.....	1,405	.....	.....
Rye.....bu.	3,087	.....	.....	2,640	2,640	1,056 00
Barley.....bu.	7,125	.....	.....	3,754	7,508	3,378 60
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	241	12,050	\$12,050 00	172	1,720	1,720 00
Sweet potatoes.....bu.	2	150	150 00	1	40	36 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	5,477	.....	58,049 00	5,103	.....	47,966 00
Flax.....bu.	26	78	66 30	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	5	2,000	50 00	4	.....	.....
Millet and hungarian.....tons	2,070	517	2,068 00	2,409	2,409	12,045 00
Milo maize.....tons	114	342	1,197 00	43	860	387 00
Kaffir corn.....tons	780	1,560	5,460 00	1,670	33,400	16,700 00
Jerusalem corn.....tons	130	130	390 00	295	5,900	2,950 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	24	393	2,358 00	63	329	1,974 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	6,082	1,597	5,589 50	4,640	2,259	9,036 00
Totals.....	57,759	.....	\$87,427 80	55,294	.....	\$99,511 88

Wheat on hand March 1, 1893, 21,577 bushels; March 1, 1894, 4,521 bushels.

Corn on hand March 1, 1893, 2,615 bushels; March 1, 1894, 874 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—HODGEMAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	57,759	\$87,427 80	55,394	\$99,511 83
Animals slaughtered and sold for slaughter.....		27,507 00		45,182 00
Milk sold.....				230 00
Poultry and eggs sold.....		6,873 00		6,276 00
Wool clip.....lbs.	31,541	5,046 56	39,764	5,169 32
Cheese.....lbs.			9,000	1,080 00
Butter.....lbs.	66,958	10,713 28	68,008	10,881 28
Garden products marketed.....		1,289 00		65 00
Horticultural products.....				
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	336	336 00		
Wood marketed.....				
Totals.....		\$139,192 64		\$168,395 48

LIVE STOCK.—HODGEMAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,669	\$138,788 00	2,606	\$85,998 00
Mules and asses.....	119	7,378 00	97	4,074 00
Milch cows.....	2,340	46,800 00	1,656	36,432 00
Other cattle.....	7,100	120,700 00	4,136	74,448 00
Sheep.....	5,288	13,220 00	7,863	19,657 50
Swine.....	672	5,040 00	458	3,206 00
Totals.....	18,188	\$331,926 00	16,816	\$223,815 50

Number of dogs in county March 1, 1893, 541; March 1, 1894, 538.

Number of sheep killed by wolves, year ending March 1, 1894, 100.

JACKSON COUNTY.

It was organized in 1857, has a territory of 658 square miles, and ranks as the 32d county in population in the state. Holton, lying a little north and east of the center, is the county seat.

The Kansas Central, a branch of the Union Pacific, Kansas City, Wyandotte & Northwestern, Central Branch Union Pacific, operated by the Missouri Pacific, and the Chicago, Rock Island & Pacific, are the railroads in the county.

The general surface is undulating, with bluffs occurring on the west and south sides of the streams. Bottom lands average one-half mile in width, and cover 13 per cent. of the entire area. Timber belts along the streams average from one-eighth to one-fourth of a mile in width, and contain the following varieties of trees: Bur, black and white oaks, shellbark and white hickory, black walnut, ash, box elder, sycamore, cottonwood, buckeye, honey locust, red and white elm, linden, redbud, and mulberry. The county is well supplied with small streams, none of them being rivers.

It is well supplied with various kinds of building stone of a superior quality, although only developed to a slight extent. In the northern portion of the county white magnesian limestone of excellent quality exists, and is easily worked when

first quarried, but becomes very hard on exposure to the atmosphere. A very hard blue limestone is found in the central portion. Upon the highlands, in the southern, western and central portions, a gray magnesian limestone is exposed. A bed of gypsum exists on Soldier creek, 12 miles west of Holton. Thin veins of coal are mined for local use in the eastern portion.

POPULATION AND VALUATION.—JACKSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	15,531	16,226	\$2,279,813	\$627,040	\$397,621	\$609,292	\$3,913,766
Adrian twp.	960	1,236	\$95,070	\$14,139	.....	.....	\$109,209
Cedar twp.	1,026	1,170	165,795	22,203	\$3,958	\$50,637	242,593
Douglas twp.	1,268	1,338	249,938	67,686	9,648	52,168	379,440
Holton city.	3,180	3,282	.....	.....	.....	.....	.....
Franklin twp.	3,981	4,047	159,110	155,446	307,752	111,431	733,739
Garfield twp.	994	1,029	167,740	28,949	6,632	39,994	243,365
Grant twp.	1,213	1,193	243,035	73,563	.....	.....	316,598
Circleville city.	223	223	.....	.....	.....	.....	.....
Jefferson twp.	900	887	150,475	38,346	13,824	77,852	280,497
Liberty twp.	704	731	180,200	38,341	.....	53,173	271,714
Netawaka city.	276	308	161,810	36,991	22,375	48,735	269,911
Netawaka twp.	601	617	.....	.....	.....	.....	.....
Soldier twp.	998	997	165,610	37,196	10,823	37,702	251,331
Straight Creek twp.	616	614	172,395	31,599	58	36,560	240,612
Washington twp.	643	712	208,550	39,587	.....	.....	248,137
Whiting city.	403	395	.....	.....	.....	.....	.....
Whiting twp.	725	729	160,085	42,994	22,501	101,040	326,620

FARM AND CROP STATISTICS.—JACKSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	10,198	16,819	\$8,409 50	4,241	52,155	\$22,948 20
Spring wheat.....bu.	15	150	67 50	.....	.....	.....
Corn.....bu.	99,354	3,576,744	929,953 44	110,873	1,995,714	718,457 04
Oats.....bu.	20,498	327,968	68,873 28	17,684	318,312	79,573 00
Rye.....bu.	381	5,715	2,171 70	1,107	16,605	7,306 20
Barley.....bu.	12	.....	.....	.....	.....	.....
Buckwheat.....bu.	42	336	252 00	22	176	105 60
Irish potatoes.....bu.	1,038	67,470	40,482 00	1,283	53,886	31,792 74
Sweet potatoes.....bu.	7	700	700 00	1	32	27 84
Castor beans.....bu.	4	32	36 80	.....	.....	.....
Sorghum.....bu.	120	.....	2,880 00	119	.....	1,768 00
Cotton.....lbs.	3	.....	.....	.....	.....	.....
Flax.....bu.	607	4,249	3,611 65	923	8,307	8,307 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	6	3,996	119 88	33	16,500	495 00
Millet and hungarian..tons	3,401	7,652	30,608 00	5,133	8,983	44,915 00
Milo maize.....tons	.....	.....	.....	3	90	40 50
Kafir corn.....tons	10	40	140 00	1	30	15 00
Jerusalem corn.....tons	1	2	6 00	.....	.....	.....
Timothy.....tons	28,529	.....	.....	24,713	.....	.....
Clover.....tons	2,018	.....	.....	844	.....	.....
Blue grass.....tons	1,991	* 16,349	98,094 00	1,501	† 15,428	92,568 00
Alfalfa.....tons	64	.....	.....	46	.....	.....
Orchard grass.....tons	61	.....	.....	4	.....	.....
Other tame grasses.....tons	550	.....	.....	1,180	.....	.....
Prairie grass, fenced..tons	62,838	23,001	92,004 00	66,901	26,652	133,260 00
Totals.....	231,748	.....	\$1,278,409 75	236,612	.....	\$1,141,584 12

Wheat on hand March 1, 1893, 20,319 bushels; March 1, 1894, 7,338 bushels.

Corn on hand March 1, 1893, 809,085 bushels; March 1, 1894, 1,074,832 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—JACKSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	231,748	\$1,278,409 75	236,612	\$1,141,584 12
Animals slaughtered and sold for slaughter.....		759,977 00		650,380 00
Milk sold.....		4,338 00		11,066 00
Poultry and eggs sold.....		43,380 00		48,582 00
Wool clip.....lbs.	410	65 60	930	120 90
Cheese.....lbs.	240	26 40	301	36 12
Butter.....lbs.	342,033	54,725 28	286,069	45,771 04
Garden products marketed.....		3,937 00		2,922 00
Horticultural products.....		2,766 00		2,094 00
Honey and beeswax.....lbs.	7,748	1,398 21	8,248	1,486 40
Wine manufactured.....gals.	1,249	1,249 00	1,407	1,407 00
Wood marketed.....		5,169 00		4,362 00
Totals.....		\$2,155,441 24		\$1,909,811 58

LIVE STOCK.—JACKSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,015	\$520,780 00	12,148	\$400,884 00
Mules and asses.....	1,027	63,674 00	1,410	59,220 00
Milch cows.....	7,600	152,000 00	8,025	176,550 00
Other cattle.....	16,926	287,742 00	17,888	321,984 00
Sheep.....	42	105 00	90	225 00
Swine.....	22,187	166,402 50	31,417	219,919 00
Totals.....	57,797	\$1,190,703 50	70,978	\$1,178,782 00

Number of dogs in county March 1, 1893, 1,273; March 1, 1894, 1,356.

JEFFERSON COUNTY.

It was one of the original territorial counties, and was organized in 1855. It has an area of 568 square miles; ranks as 34th in population. Oskaloosa, situated east and a little south of the center, is the county seat. Valley Falls, in the northwestern corner, is the largest city in the county. Nortonville, Meriden, Winchester, Perry, Osawkie and McLouth are all thriving towns. Grantville, Rock Creek, Dunavant and Thompsonville are also places of local importance, doing considerable trade with the surrounding country.

The railroads in the county are: The Atchison, Topeka & Santa Fé; Union Pacific; Leavenworth, Topeka & Southwestern, and Kansas Central, operated by the Union Pacific; and the Kansas City, Wyandotte & Northwestern.

The general surface of the county is an undulating prairie, with but few rough lands. The creek valleys average one-half mile in width, while the bottom lands on the Kansas river spread out to a distance of 2½ miles. The bottom lands comprise about 15 per cent. of the total area. Timber belts range from one-fourth to one-half mile in width, and contain the following varieties of trees: Cottonwood, oak, elm, maple, walnut, hackberry, and hickory. Springs are not numerous, and, at a depth

of 30 feet, well water can be reached in almost any portion of the county. The Kansas river forms all of the southern boundary, except the eastern six miles. The Delaware river enters the county on the northern boundary, $4\frac{1}{2}$ miles east of the northwestern corner.

POPULATION AND VALUATION.—JEFFERSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	15,238	16,174	\$2,457,607	\$440,869	\$300,130	\$841,859	\$4,040,465
Valley Falls city	1,054	1,157	\$413,000	\$74,110	\$88,830	\$215,295	\$791,235
Delaware twp.	1,527	1,626					
Fairview twp.	710	732	109,540	19,482			129,022
Winchester city.	372	476	280,115	50,125	29,570	74,420	434,230
Jefferson twp.	1,224	1,372					
Kaw twp.	535	831	198,240	24,016	6,060	81,019	309,335
Perry city	400	411	188,754	31,385	18,855	96,508	335,502
Kentucky twp.	946	1,008					
Oskaloosa city	619	635	179,900	21,108	8,685	46,247	255,940
Nortonville city	619	635					
Norton twp.	768	679	186,535	60,710	44,440	40,634	332,319
Osawkee twp.	975	1,034	179,900	21,108	8,685	46,247	255,940
Oskaloosa city	816	837	280,800	46,580	51,430	62,341	391,151
Oskaloosa twp.	1,213	1,220					
Meriden city.	431	438	234,693	44,153	32,320	120,727	431,893
Rock Creek twp.	1,024	1,036					
Rural twp.	882	921	139,475	14,825	730	64,125	219,155
Saxcozie twp.	535	603	118,440	13,335			131,775
McLouth city.	366	342	178,115	41,040	19,210	40,543	278,908
Union twp.	841	816					

FARM AND CROP STATISTICS.—JEFFERSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat. ....bu.	26,796	195,610	\$93,892 80	16,157	235,566	\$91,870 74
Spring wheat. ....bu.				37		
Corn	89,430	2,861,760	715,440 00	99,241	1,984,820	734,383 40
Oats.	20,708	393,452	78,690 40	18,253	322,712	83,905 12
Rye.	512	9,216	3,686 40	878	14,926	6,418 18
Barley.				4	40	16 09
Buckwheat. ....bu.	5		30 00	13	104	62 40
Irish potatoes. ....bu.	1,643	131,440	65,720 00	3,630	199,650	103,818 00
Sweet potatoes. ....bu.	22	2,420	2,420 00	53	4,770	2,480 40
Castor beans. ....bu.						
Sorghum.	250		7,800 00	826		20,843 00
Flax.	968	7,744	6,582 40	698	5,584	5,584 00
Tobacco						
Broom corn. ....lbs.	93	46,500	1,395 00	28		
Millet and hungarian, tons	2,576	5,152	20,608 00	3,928	7,856	39,280 00
Milo maize. ....tons	2	† 8	28 00	5	150	67 50
Kafir corn. ....tons				29	† 870	435 00
Jerusalem corn. ....tons						
Timothy. ....tons	32,879			24,991		
Clover. ....tons	1,834			2,459		
Blue grass. ....tons	11,864	* 13,684	82,104 00	9,127	† 16,590	99,540 00
Alfalfa. ....tons	2			55		
Orchard grass. ....tons	83			46		
Other tame grasses. ....tons	928			3,891		
Frailie grass, fenced. ....tons	24,999	11,858	50,396 50	25,842	14,066	56,264 00
Totals.	215,594		\$1,128,793 50	210,191		\$1,244,967 74

Wheat on hand March 1, 1893, 59,350 bushels; March 1, 1894, 50,518 bushels.

Corn on hand March 1, 1893, 689,003 bushels; March 1, 1894, 756,434 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Blue and gray limestone are found in great abundance in almost every portion of the county. In the bluffs bordering on the bottoms this stone is found in layers of from 18 to 30 inches in thickness. It is a very superior stone for heavy masonry work. Sandstone of a fair quality is found in several localities. Cement is found underlying limestone throughout the southern half.

SUMMARY.—JEFFERSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	215,594	\$1,128,793 50	210,191	\$1,244,967 74
Animals slaughtered and sold for slaughter.....		766,803 00		765,808 00
Milk sold.....		660 00		15,401 00
Poultry and eggs sold.....		50,542 00		54,842 00
Wool clip.....lbs.	3,120	499 20	3,324	432 12
Cheese.....lbs.	8,000	880 00	900	108 00
Butter.....lbs.	382,921	61,267 36	362,041	57,926 56
Garden products marketed.....		4,287 00		13,174 00
Horticultural products.....		1,187 00		3,110 00
Honey and beeswax.....lbs.	3,552	641 46	3,875	698 00
Wine manufactured.....gals.	1,372	1,372 00	820	820 00
Wood marketed.....		6,317 00		6,478 00
Totals.....		\$2,023,249 52		\$2,163,265 42

LIVE STOCK.—JEFFERSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,732	\$610,064 00	10,536	\$347,668 00
Mules and asses.....	1,293	80,166 00	1,559	65,478 00
Milch cows.....	7,942	158,840 00	7,212	158,664 00
Other cattle.....	19,854	337,518 00	18,673	336,114 00
Sheep.....	1,275	3,187 50	903	2,257 50
Swine.....	24,743	185,572 50	32,761	229,327 00
Totals.....	66,839	\$1,375,348 00	71,644	\$1,139,528 50

Number of dogs in county March 1, 1893, 2,007; March 1, 1894, 2,281.

Number of sheep killed by wolves, year ending March 1, 1894, 18.

JEWELL COUNTY.

It has an area of 900 square miles, and ranks as the 28th county in point of population. It was organized in 1870. Mankato, lying in the exact center, is the county seat. Jewell, in the southeastern portion, and Burr Oak, in the northwestern, are thriving and important places.

The railroads in the county are: The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé; Atchison, Jewell County & Western, a branch of the Missouri Pacific; and the Chicago, Rock Island & Pacific.

The general surface is gently undulating, there being but few bluffs and very little rough land. The river and creek bottoms average one-half mile in width, and, in the aggregate, comprise 16 per cent. of the total county area. Timber belts on the

POPULATION AND VALUATION.—JEWELL COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	17,930	17,468	\$2,422,433	\$420,004	\$217,511	\$451,206	\$3,511,154
Allen twp.....	671	655	\$104,975	\$7,335	\$4,509	\$27,368	\$144,187
Athens twp.....	570	535	116,644	15,818	.....	.....	132,462
Brown's Creek twp..	534	565	102,420	13,310	.....	.....	115,730
Burr Oak city.....	656 } 1,493	573 } 1,294	118,329	30,188	32,878	15,023	196,418
Burr Oak twp.....	837 }	721 }	.....	.....	.....	.....	.....
Jewell city.....	655 }	696 }	137,222	42,416	51,610	20,691	251,939
Buffalo twp.....	688 }	694 }	62,026	10,975	.....	20,514	93,515
Calvin twp.....	407	406	.....	.....	.....	.....	.....
Mankato city.....	800 }	770 }	102,946	46,110	82,534	84,664	316,254
Center twp.....	504 }	458 }	.....	.....	.....	.....	.....
Erving twp.....	514	488	90,205	6,450	.....	.....	96,655
Ezbon twp.....	630	699	97,538	20,819	8,721	45,010	172,088
Grant twp.....	811	586	109,093	19,839	11,528	47,443	187,903
Harrison twp.....	586	647	100,274	16,904	.....	.....	117,178
Highland twp.....	579	619	71,219	11,030	.....	.....	82,249
Holmwood twp.....	531	591	86,014	18,566	.....	6,244	110,824
Ionia twp.....	622	572	106,708	19,425	4,733	.....	130,866
Webber city.....	.....	88 }	.....	.....	.....	.....	.....
Jackson twp.....	689	592 }	108,747	16,030	3,657	18,698	147,132
Otego city.....	.....	74 }	.....	.....	.....	.....	.....
Limestone twp.....	703	666 }	103,676	21,268	3,514	51,059	179,517
Montana twp.....	686	691	92,911	8,541	.....	15,744	117,196
Odessa twp.....	504	491	67,059	10,881	.....	.....	77,940
Prairie twp.....	734	673	107,910	11,507	6,557	13,924	139,898
Richland twp.....	523	471	65,333	6,518	.....	.....	71,851
Sinclair twp.....	655	635	92,617	17,923	1,550	37,979	150,069
Vicksburg twp.....	652	635	106,555	8,555	43	.....	115,153
Walnut twp.....	737	780	93,590	14,906	2,459	.....	110,955
Washington twp.....	667	620	79,132	11,061	2,411	46,845	139,449
White Mound twp....	735	777	99,290	13,629	807	.....	113,726

FARM AND CROP STATISTICS.—JEWELL COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	54,326	89,092	\$39,200 48	34,627	96,950	\$39,749 50
Spring wheat.....bu.	146	.....	.....	234	.....	.....
Corn.....bu.	173,166	2,943,822	735,955 50	194,115	582,345	221,291 10
Oats.....bu.	39,906	359,154	82,605 42	27,500	123,750	34,650 00
Rye.....bu.	4,284	21,420	8,139 60	1,668	8,340	3,419 40
Barley.....bu.	66	.....	.....	.....	.....	.....
Buckwheat.....bu.	37	185	138 75	24	192	115 20
Irish potatoes.....bu.	1,714	109,696	107,502 08	1,649	23,086	20,084 82
Sweet potatoes.....bu.	3	150	150 00	.....	.....	.....
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	1,104	.....	16,774 00	1,044	.....	12,488 00
Flax.....bu.	20	100	85 00	60	240	240 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	158	79,000	1,975 00	48	.....	.....
Millet and hungarian..tons	7,049	10,573	42,292 00	12,664	12,664	50,656 00
Milo maize.....tons	.....	.....	.....	5	† 100	45 00
Kafir corn.....tons	.....	.....	.....	11	† 220	110 00
Jerusalem corn.....tons	.....	.....	.....	.....	.....	.....
Timothy.....tons	1,305	.....	.....	408	.....	.....
Clover.....tons	328	.....	.....	15	.....	.....
Blue grass.....tons	139	.....	.....	113	.....	.....
Alfalfa.....tons	2,262	* 6,659	39,954 00	3,999	† 8,557	51,342 00
Orchard grass.....tons	51	.....	.....	11	.....	.....
Other tame grasses.....tons	33	.....	.....	18	.....	.....
Prairie grass, fenced..tons	95,575	16,779	83,895 00	100,045	12,630	50,520 00
Totals.....	381,672	.....	\$1,158,666 83	379,258	.....	\$484,711 02

Wheat on hand March 1, 1893, 129,313 bushels; March 1, 1894, 60,524 bushels.

Corn on hand March 1, 1893, 1,672,577 bushels; March 1, 1894, 816,818 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

streams are narrow, averaging a width of about 20 rods, and contain the following varieties of trees: Cottonwood, ash, elm, oak, walnut, box elder, and hackberry.

Magnesian limestone of an excellent quality underlies nearly the entire county, the best for building purposes being in the southern portion. A limestone of from 8 to 10 inches in thickness, which makes the finest building rock in that part of the state, is quarried in the southern portion. Gypsum of good quality is found in the western and central portions. Salt springs and marshes exist on sections 11, 24, and 25, in Vicksburg township. Coal of good quality has been found at a depth of 150 feet at Omio and Jewell, and at a depth of 450 feet at Mankato.

SUMMARY.—JEWELL COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	381,672	\$1,158,666 83	379,258	\$484,711 02
Animals slaughtered and sold for slaughter.....		1,179,383 00		1,198,781 00
Milk sold.....		60 00		1,811 00
Poultry and eggs sold.....		99,539 00		99,379 00
Wool clip.....lbs.	200	32 00	208	27 04
Cheese.....lbs.	3,820	420 20	1,000	120 00
Butter.....lbs.	558,533	89,365 28	548,870	87,819 20
Garden products marketed.....		1,424 00		324 00
Horticultural products.....		985 00		247 00
Honey and beeswax.....lbs.	16,696	3,005 28	2,836	510 64
Wine manufactured.....gals.	377	377 00	55	55 00
Wood marketed.....		215 00		681 00
Totals.....		\$2,533,472 59		\$1,874,465 90

LIVE STOCK.—JEWELL COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	16,541	\$860,132 00	16,980	\$560,340 00
Mules and asses.....	1,369	84,878 00	1,403	58,926 00
Milch cows.....	9,999	199,980 00	9,659	212,498 00
Other cattle.....	27,566	468,622 00	19,992	359,856 00
Sheep.....	29	72 50	4	10 00
Swine.....	48,915	366,862 50	49,621	347,347 00
Totals.....	104,419	\$1,980,547 00	97,659	\$1,538,977 00

Number of dogs in county March 1, 1893, 2,555; March 1, 1894, 2,737.

JOHNSON COUNTY.

Was one of the original territorial counties, and was organized in 1855. It has an area of 480 square miles, and ranks 35th in population. The city of Olathe, lying near the center, is the county seat. The towns of Spring Hill, Edgerton, and Gardner, in the southern portion of the county, and De Soto, in the northwestern portion, are places of considerable local importance.

The railroads in the county are: The Kansas City, Topeka & Western, Southern Kansas, Leavenworth, Northern & Southern, all of the Atchison, Topeka, Santa Fé

system; Kansas City, Fort Scott & Memphis; Kansas City, Clinton & Springfield; and the Kansas City & Southwestern, operated by the Missouri Pacific.

The general surface is high, rolling prairie, with black loam soil. Bottom lands average one-half of a mile in width, and, in the aggregate, make about 10 per cent. of the county area. Timber belts range from 40 rods to one mile in width, and contain the following varieties of trees: White, black and jack oaks, slippery, white and red elm, walnut, mulberry, redbud, hickory, locust, wild cherry, and some syc-

POPULATION AND VALUATION.—JOHNSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	15,130	16,147	\$2,205,927	\$543,911	\$410,416	\$1,012,423	\$4,172,767
Aubrey twp.....	997	974	\$160,743	\$34,472	\$7,398	\$48,993	\$251,606
Gardner city.....	271 } 1,172	344 } 1,224	214,473	63,152	16,370	50,578	344,573
Lexington twp.....	901 } 1,242	880 } 1,733	263,885	45,959	6,032	126,455	442,331
Edgerton city.....	268 } 1,170	269 } 1,151	185,829	46,251	17,105	46,476	295,661
McCamish twp.....	902 } 703	882 } 800	218,163	52,880	4,044	20,142	295,229
Mission twp.....	1,012	1,224	170,335	31,223	4,949	204,990	411,497
Monticello twp.....	1,170	1,454	293,628	63,077	3,439	102,911	463,055
Oxford twp.....	3,448 } 4,718	3,427 } 4,761	342,150	133,571	285,718	244,259	1,005,698
Olathe city.....	1,270 } 1,717	1,334 } 1,602	219,728	32,869	31,137	100,347	384,081
Olathe twp.....	580 } 1,229	601 } 1,224	136,993	40,457	34,224	67,272	279,036
Shawnee twp.....	649 }	623 }					
Spring Hill city.....							
Spring Hill twp.....							

FARM AND CROP STATISTICS.—JOHNSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	28,308	338,559	\$162,508 32	19,693	380,457	\$155,987 37
Spring wheat.....bu.				20	240	100 80
Corn.....bu.	67,676	1,962,604	549,529 12	69,804	1,745,100	610,785 00
Oats.....bu.	24,112	313,456	65,825 76	18,027	331,683	89,554 41
Rye.....bu.	241	2,651	1,192 95	490	8,820	3,616 20
Barley.....bu.	50	550	165 00	227	5,675	2,270 00
Buckwheat.....bu.	12	120	90 00	152	1,216	729 60
Irish potatoes.....bu.	1,462	106,726	59,766 56	2,993	197,538	94,813 24
Sweet potatoes.....bu.	47	3,290	3,290 00	59	4,484	2,959 44
Castor beans.....bu.	15	120	138 00	15	180	180 00
Sorghum.....bu.	139		5,315 00	114		3,297 00
Flax.....bu.	1,060	8,480	7,298 00	1,384	15,224	15,224 00
Tobacco.....lbs.				6	3,600	360 00
Broom corn.....lbs.	12	6,000	180 00	10	6,000	120 00
Millet and hungarian, tons	732	1,281	5,124 00	385	770	3,080 00
Milo maize.....tons				2	† 80	36 00
Kaffir corn.....tons				4	† 120	60 00
Jerusalem corn.....tons						
Timothy.....tons	37,171	* 21,375	128,250 00	33,167	† 25,149	150,894 00
Clover.....tons	4,635			4,826		
Blue grass.....tons	16,609			18,162		
Alfalfa.....tons	13			23		
Orchard grass.....tons						
Other tame grasses.....tons	3,979			9,741		
Prairie grass, fenced.....tons	4,624	3,251	11,378 50	5,080	4,667	23,335 00
Totals.....	190,887		\$999,961 21	184,384		\$1,157,407 06

Wheat on hand March 1, 1893, 80,670 bushels; March 1, 1894, 79,398 bushels.

Corn on hand March 1, 1893, 416,350 bushels; March 1, 1894, 470,285 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

more. Most of the timber in this county is jack oak and hickory. Good springs are plentiful in all sections, and well water is reached at an average depth of 25 feet. The Kansas river, flowing north of east, forms more than half of the northern boundary.

SUMMARY.—JOHNSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	190,887	\$999,961 21	184,384	\$1,157,407 06
Animals slaughtered and sold for slaughter.....		484,001 00		593,363 00
Milk sold.....		30,570 00		43,840 00
Poultry and eggs sold.....		37,058 00		49,648 00
Wool clip.....lbs.	3,904	624 64	7,942	1,032 46
Cheese.....lbs.	5,750	632 50	8,520	1,022 40
Butter.....lbs.	315,120	50,419 20	379,782	60,765 12
Garden products marketed.....		17,599 00		15,866 00
Horticultural products.....		7,678 00		2,297 00
Honey and beeswax.....lbs.	5,490	989 60	1,800	326 30
Wine manufactured.....gals.	2,358	2,358 00	1,544	1,544 00
Wood marketed.....		853 00		826 00
Totals.....		\$1,632,744 15		\$1,927,937 34

LIVE STOCK.—JOHNSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	9,487	\$493,324 00	11,271	\$371,943 00
Mules and asses.....	1,057	65,534 00	1,167	49,014 00
Milch cows.....	6,289	125,780 00	6,291	138,402 00
Other cattle.....	12,082	205,394 00	11,496	206,928 00
Sheep.....	1,663	4,157 50	8,482	21,205 00
Swine.....	19,940	149,550 00	14,289	100,023 00
Totals.....	50,518	\$1,043,739 50	52,996	\$887,515 00

Number of dogs in county March 1, 1893, 1,704; March 1, 1894, 1,805.

Number of sheep killed by dogs, year ending March 1, 1894, 145.

Number of sheep killed by wolves, year ending March 1, 1894, 36.

KEARNY COUNTY.

The state legislature in 1887 created the county of Kearny by detaching 12 townships on the west side of Finney county and 12 on the east side of Hamilton county, thus giving to Kearny an area of 864 square miles. It was organized in 1888, and now ranks as the 98th county in the state in number of inhabitants. Hartland, situated on the Atchison, Topeka & Santa Fé railroad, near the center, is the county seat. The Atchison, Topeka & Santa Fé railroad, following the Arkansas river, crosses the county a little south of the center.

The surface of the county is generally level or rolling. The valley of the Arkansas river is from four to six miles wide, and contains about all of the bottom land. A few scattering cottonwood trees are found along this stream. Quarries of a superior quality of limestone and sandstone, and a blue limestone from which lime is made, are located along the Arkansas, furnishing building material in abundance. Beds of gypsum also exist.

POPULATION AND VALUATION.—KEARNY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	1,242	1,214	\$626,231	\$40,463	\$29,309	\$298,885	\$994,888
Hartland twp.....	171	192	\$94,476	\$7,892	\$7,642	\$71,035	\$184,045
Hibbard twp.....	95	69	115,581	741	.....	.....	116,322
Kearny twp.....	73	60	102,766	352	154	.....	103,272
Kendall twp.....	159	147	93,078	4,953	262	71,988	170,281
Lakin twp.....	599	598	131,515	15,032	21,251	152,862	320,660
South Side twp.....	145	148	88,815	11,493	.....	.....	100,308

FARM AND CROP STATISTICS.—KEARNY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	11,390	1,816	\$908 00	8,468	11,851	\$5,332 95
Spring wheat.....bu.	995	392	176 40	404	606	248 46
Corn.....bu.	565	.....	.....	620	5,580	2,790 00
Oats.....bu.	2,642	26,420	6,605 00	2,215	6,372	1,911 60
Rye.....bu.	664	.....	.....	286	286	128 70
Barley.....bu.	1,681	.....	.....	638	3,828	1,416 36
Buckwheat.....bu.	.....	.....	.....	1	8	4 80
Irish potatoes.....bu.	99	3,960	2,494 80	109	7,085	7,085 00
Sweet potatoes.....bu.	15	1,500	1,500 00	23	1,219	707 02
Castor beans.....bu.	14	42	48 30	30	150	150 00
Sorghum.....bu.	1,743	.....	14,640 00	1,794	.....	8,845 40
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	2,199	1,319,400	32,985 00	206	41,200	1,236 00
Millet and hungarian, tons	58	29	116 00	37	28	140 00
Milo maize.....tons	100	250	875 00	57	570	256 50
Kaffir corn.....tons	951	1,902	6,657 00	1,946	19,460	9,730 00
Jerusalem corn.....tons	2,018	4,036	12,108 00	1,559	31,180	15,590 00
Timothy.....tons	4	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	3,857	* 5,052	30,312 00	3,900	† 5,439	32,634 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	10	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	2,730	1,575	5,906 25	2,963	1,029	4,116 00
Totals.....	31,735	.....	\$115,331 75	25,256	.....	\$92,322 79

Wheat on hand March 1, 1893, 23,175 bushels; March 1, 1894, 520 bushels.

Corn on hand March 1, 1893, 1,697 bushels; March 1, 1894, 220 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—KEARNY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	31,735	\$115,331 75	25,256	\$92,322 79
Animals slaughtered and sold for slaughter.....		19,477 00		12,141 00
Milk sold.....		61 00		15 00
Poultry and eggs sold.....		3,552 00		2,449 00
Wool clip.....lbs.	5,233	837 28	7,070	919 10
Cheese.....lbs.	1,030	113 30	600	72 00
Butter.....lbs.	33,820	5,411 20	22,835	3,653 60
Garden products marketed.....		2,239 00		4,208 00
Horticultural products.....		200 00		25 00
Honey and beeswax.....lbs.	375	67 85	50	9 00
Wine manufactured.....gals.	25	25 00		
Wood marketed.....				
Totals.....		\$147,315 38		\$115,814 49

LIVE STOCK.—KEARNY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,167	\$60,684 00	1,151	\$37,983 00
Mules and asses.....	184	11,408 00	134	5,628 00
Milk cows.....	690	13,800 00	577	12,694 00
Other cattle.....	2,575	43,775 00	1,532	27,576 00
Sheep.....	2,011	5,027 50	1,475	3,687 50
Swine.....	485	3,637 50	533	3,731 00
Totals.....	7,112	\$138,332 00	5,402	\$91,299 50

Number of dogs in county March 1, 1893, 208; March 1, 1894, 186.

Number of sheep killed by wolves, year ending March 1, 1894, 31.

KINGMAN COUNTY.

It has an area of 864 square miles; ranks as 59th in population. The city of Kingman, lying north and east of the center, on the Ninnescah river, is the capital. There are several small towns in the county. It was organized in 1873.

The railroads in the county are: The Chicago, Kansas & Western and the Wichita & Western, divisions of the Atchison, Topeka & Santa Fé; Denver, Memphis & Atlantic, of the Missouri Pacific; and the Hutchinson & Southern.

The surface of the county is a gently rolling prairie, the proportion of bottom land being about 15 per cent. of the total area. The valleys of the Ninnescah and Chikaskia rivers average about one mile in width, and a few scattering cottonwood trees are found here. A few small lakes are in the county, and abundant springs are found in several portions, and are exceedingly valuable. Well water is reached at an average depth of 25 feet, there being instances of good veins of water 10 feet below the surface. The Chikaskia river enters the county at the southwestern corner, and flows northeast and southeast, crossing the southern boundary $5\frac{1}{2}$ miles west of the southeastern corner.

POPULATION AND VALUATION.—KINGMAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	11,055	10,091	\$1,686,654	\$164,519	\$327,886	\$640,973	\$2,820,032
Allen twp.	296	280	\$68,744	\$4,173	.....	\$7,502	\$80,419
Belmont twp.	322	310	73,170	3,463	\$282	.....	76,915
Norwich city	252 } 682	329 } 680	78,999	9,637	17,913	52,964	159,513
Bennett twp.	430 }	351 }					
Canton twp.	342	326	64,305	4,143	.....	27,800	96,248
Chicaskia twp.	400	341	59,735	2,544	8,165	35,699	106,143
Dale twp.	308	297	63,409	4,366	2,035	28,854	98,664
Dresden twp.	378	290	64,405	5,539	2,714	4,476	77,134
Eagle twp.	331	303	73,047	4,225	.....	30,465	107,737
Eureka twp.	316	259	68,026	2,213	60	25,859	96,158
Evan twp.	465	425	74,800	2,287	.....	.....	77,087
Galesburg twp.	573	526	77,417	7,085	807	.....	85,309
Hoosier twp.	369	400	86,565	3,374	.....	27,777	117,716
Kingman twp.	276	217	70,050	6,841	254	.....	77,145
Liberty twp.	239	214	53,845	5,120	3,306	29,268	91,539
Kingman city	2,066 }	1,962 }					
Ninnescah twp.	484 }	456 }	142,324	60,785	287,378	112,730	603,217
Peters twp.	223	200	55,685	1,971	.....	.....	57,656
Richland twp.	468	443	74,180	5,864	393	43,871	124,308
Rochester twp.	385	333	56,186	2,673	508	29,124	88,491
Rural twp.	392	371	71,812	5,516	993	23,514	101,835
Union twp.	333	261	68,706	7,302	244	27,712	103,964
Valley twp.	366	260	64,525	4,700	2,834	54,808	126,867
Vinita twp.	419	369	75,288	4,666	.....	26,340	106,294
White twp.	622	568	101,431	6,032	.....	52,210	159,673

FARM AND CROP STATISTICS.—KINGMAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	92,724	380,165	\$152,066 00	87,737	279,873	\$106,351 74
Spring wheat.....bu.	8	.....	.....	.....	.....	.....
Corn.....bu.	49,552	198,208	69,372 80	62,975	566,775	209,706 75
Oats.....bu.	18,053	108,318	27,079 50	13,234	53,792	15,117 76
Rye.....bu.	405	.....	.....	286	2,860	1,029 60
Barley.....bu.	935	5,510	1,653 00	754	13,572	5,428 80
Buckwheat.....bu.	11	44	33 00	.....	.....	.....
Irish potatoes.....bu.	351	.....	.....	249	4,482	2,689 20
Sweet potatoes.....bu.	3	150	150 00	5	250	200 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	486	.....	5,589 00	524	.....	5,502 00
Flax.....bu.	366	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	15	7,500	187 50	45	9,000	270 00
Millet and hungarian..tons	847	1,058	5,290 00	850	850	4,250 00
Milo maize.....tons	90	270	945 00	188	1,880	846 00
Kafir corn.....tons	237	711	2,489 00	1,273	12,730	6,365 00
Jerusalem corn.....tons	4	8	24 00	4	40	20 00
Timothy.....tons	55	.....	.....	72	.....	.....
Clover.....tons	2	.....	.....	3	.....	.....
Blue grass.....tons	3	.....	.....	19	72	4 32
Alfalfa.....tons	400	* 581	3,486 00	556	†	.....
Orchard grass.....tons	1	.....	.....	3	.....	.....
Other tame grasses.....tons	19	.....	.....	18	.....	.....
Prairie grass, fenced...tons	71,110	16,984	67,936 00	54,826	7,920	31,680 00
Totals.....	235,311	.....	\$336,300 80	223,621	.....	\$389,461 17

Wheat on hand March 1, 1893, 104,068 bushels; March 1, 1894, 71,367 bushels.

Corn on hand March 1, 1893, 226,658 bushels; March 1, 1894, 34,394 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Red sandstone is quarried in sufficient quantities for the local demand, near the city of Kingman, and eight miles south, at the town of Cleveland. This stone is very soft when first quarried, but hardens rapidly on exposure to the atmosphere. Mineral paint is found in abundant quantities near Kingman, which has been worked to some extent. Inexhaustible beds of gypsum exist in the southwestern portion of the county. Fire clay has been discovered a short distance from the city of Kingman. Vast beds of rock salt underlie many portions of the county. Veins of coal six inches in thickness have been found at a depth of 600 feet.

SUMMARY.—KINGMAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	235,311	\$336,300 80	223,621	\$389,461 17
Animals slaughtered and sold for slaughter.....		377,099 00		281,447 00
Milk sold.....		1,709 00		1,236 00
Poultry and eggs sold.....		17,695 00		16,613 00
Wool clip.....lbs.	8,700	1,392 00	3,500	455 00
Cheese.....lbs.	1,580	173 80	1,100	132 00
Butter.....lbs.	218,846	35,015 36	184,977	29,596 32
Garden products marketed.....		2,403 00		1,550 00
Horticultural products.....		1,449 00		17,148 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	204	204 00	82	82 00
Wood marketed.....				
Totals.....		\$773,440 96		\$737,720 49

LIVE STOCK.—KINGMAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	8,069	\$419,588 00	7,584	\$250,272 00
Mules and asses.....	1,134	70,308 00	1,071	44,982 00
Milch cows.....	5,008	100,160 00	4,364	96,008 00
Other cattle.....	17,023	289,391 00	11,248	202,464 00
Sheep.....	3	7 50	755	1,887 50
Swine.....	12,773	95,797 50	9,781	68,467 00
Totals.....	44,010	\$975,252 00	34,803	\$664,080 50

Number of dogs in county March 1, 1893, 1,694; March 1, 1894, 1,556.

Number of sheep killed by wolves, year ending March 1, 1894, 3.

KIOWA COUNTY.

Kiowa county was created by the state legislature of 1886, two tiers of townships being taken from the north side of Comanche county, and two from the south side of Edwards county. It was organized in March, 1886, with an area of 720 square miles, and ranks as the 84th county in point of population. Greensburg, north of the center, is the county seat.

The lines of railroad in the county are: The Chicago, Kansas & Western and the Wichita & Western, operated by the Atchison, Topeka & Santa Fé; and the Chicago, Rock Island & Pacific.

The surface is gently rolling prairie, there being but few streams and hardly any timber. The Medicine Lodge river and several of its small tributaries have their sources in the southeastern portion. The main stream has a general eastern direction, and crosses the eastern border into Barber county. Sand and Cavalry creeks have their head waters in the southeastern portion, and flow south into Comanche county.

POPULATION AND VALUATION.—KIOWA COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	3,187	2,750	\$989,277	\$72,847	\$59,409	\$347,751	\$1,469,284
Brenham twp.....	267	256	\$64,063	\$3,520	\$570	\$57,326	\$125,479
Butler twp.....	110	102	38,074	387			38,461
Greensburg city.....	625 } 748	506 } 620	58,109	16,065	47,644	60,134	181,952
Center twp.....	123 } 123	114 } 109	54,532	1,768		56,067	112,367
Garfield twp.....	123	109	137,314	17,120	456	54,248	209,138
Glick twp.....	270	191	97,648	7,050			104,698
Kiowa twp.....	106	81	60,568	1,133			61,701
Lincoln twp.....	157	148					
Mullinville city.....	122 } 446	72 } 351	140,555	5,683	2,993	58,874	208,105
Martin twp.....	324 } 101	279 } 75	79,942	3,119	254		83,315
Reeder twp.....	101	75	39,844	498			40,342
Union twp.....	64	52	98,928	3,509			102,437
Ursula twp.....	174	159	44,440	460			44,900
Valley twp.....	120	109					
Haviland city.....		79 }					
Wellsford city.....		113 }	35,260	12,535	7,492	61,102	166,389
Wellsford twp.....	501	305 }					

FARM AND CROP STATISTICS.—KIOWA COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	55,524	333,144	\$133,257 60	52,196	31,317	\$11,587 29
Spring wheat.....bu.						
Corn.....bu.	9,985	49,925	18,971 50	9,164	45,820	18,328 00
Oats.....bu.	4,299		1,224	1,224	915	320 25
Rye.....bu.	1,344	6,720	2,688 00	1,224	3,672	1,468 80
Barley.....bu.	7,857			3,581	10,743	4,619 49
Buckwheat.....bu.						
Irish potatoes.....bu.	66			240	4,800	4,800 00
Sweet potatoes.....bu.	4	200	200 00	6	336	369 60
Castor beans.....bu.						
Sorghum.....bu.	2,235		16,760 00	1,845		9,869 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	200	100,000	2,500 00	341		
Millet and hungarian, tons	800	800	4,000 00	316	316	1,264 00
Milo maize.....tons	27	81	283 00	48	480	216 00
Kafir corn.....tons	491	1,473	5,156 00	1,220	6,100	3,050 00
Jerusalem corn.....tons	10	15	45 00	26	130	65 00
Timothy.....tons				2		
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	106	* 1,928	11,568 00	27	† 106	636 00
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced...tons	10,831	1,903	9,515 00	11,850	1,253	6,265 00
Totals.....	93,779		\$204,944 10	83,310		\$62,858 43

Wheat on hand March 1, 1893, 18,103 bushels; March 1, 1894, 12,316 bushels.

Corn on hand March 1, 1893, 10,626 bushels; March 1, 1894, 2,510 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Limestone and a superior quality of sandstone are found in the southern portion; also, extensive beds of gypsum, lying near the surface.

SUMMARY.—KIOWA COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	93,779	\$204,944 10	83,310	\$62,858 43
Animals slaughtered and sold for slaughter.....		73,717 00		67,552 00
Milk sold.....		35 00		261 00
Poultry and eggs sold.....		5,675 00		4,923 00
Wool clip.....lbs.	20	3 20		
Cheese.....lbs.	105	11 55	50	6 00
Butter.....lbs.	64,541	10,326 56	79,887	12,781 92
Garden products marketed.....		1,129 00		239 00
Horticultural products.....				100 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	36	36 00		
Wood marketed.....				
Totals.....		\$295,877 41		\$148,711 35

LIVE STOCK.—KIOWA COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,743	\$142,636 00	2,546	\$84,018 00
Mules and asses.....	456	28,272 00	415	17,430 00
Milch cows.....	1,956	39,120 00	1,378	30,316 00
Other cattle.....	5,968	101,456 00	3,267	58,806 00
Sheep.....	16	40 00	6	15 00
Swine.....	1,097	8,227 50	949	6,643 00
Totals.....	12,236	\$319,751 50	8,561	\$197,228 00

Number of dogs in county March 1, 1893, 279; March 1, 1894, 345.

Number of sheep killed by wolves, year ending March 1, 1894, 2.

LABETTE COUNTY.

Was organized in 1867, with a territory of 649 square miles, and now ranks as the 11th county in population. Oswego, situated on the Neosho river, in the east-central portion, is the county seat. At Parsons, lying in the north-central portion, the headquarters of the Kansas City & Pacific railroad are established; also the headquarters and general offices and the machine and repair shops of the Missouri, Kansas & Texas railroad, giving employment to a large number of people. Chetopa, in the southeastern portion, is a place of much commercial importance. Altamont, in the central portion, and Mound Valley, in the west central, command a large local trade.

The county is abundantly supplied with railroad facilities, having lines extending in all portions, the principal of which are divisions of the Atchison, Topeka & Santa Fé, Missouri, Kansas & Texas, Missouri Pacific, and St. Louis & San Francisco.

The general surface is a gently undulating prairie, with some large hills in the

POPULATION AND VALUATION.—LABETTE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	26,201	25,956	\$1,584,724	\$381,130	\$967,370	\$1,131,918	\$4,065,142
Canada twp.....	560	639	\$94,303	\$7,601	\$540	\$50,774	\$153,218
Elm Grove twp.....	1,297	1,252	111,218	16,288	6,702	29,737	163,945
Fairview twp.....	567	707	94,596	6,161	.....	48,036	148,793
Hackberry twp.....	906	1,085	130,947	14,218	6,242	31,079	182,486
Howard twp.....	759	678	95,344	4,055	804	39,221	139,424
Labette twp.....	671	650	85,039	8,364	.....	39,556	132,959
Liberty twp.....	801	803	86,461	8,556	2,373	74,242	171,632
Montana twp.....	595	662	63,878	6,587	3,668	.....	74,133
Mound Valley city.....	.....	455	.....	.....	.....	.....	.....
Mound Valley twp.....	1,532	968 } 1,423	151,253	6,322	30,415	118,508	306,498
Mount Pleasant twp.....	1,106	1,058	83,693	6,048	16,724	47,372	153,837
Neosho twp.....	387	587	69,612	2,886	.....	43,412	115,910
Parsons city.....	8,396	8,220 } 9,029	112,406	137,226	631,757	208,423	1,089,852
North twp.....	707	809	137,401	10,080	3,839	92,194	243,514
Osage twp.....	1,407	1,340	82,177	71,434	140,410	114,487	408,508
Oswego city.....	2,115	2,265	.....	.....	.....	.....	.....
Oswego twp.....	549 } 2,664	513 } 2,778	82,177	71,434	140,410	114,487	408,508
Chetopa city.....	2,188	1,997	98,416	72,587	123,896	116,266	411,165
Richland twp.....	1,020	667	87,980	2,677	.....	78,611	169,268
Walton twp.....	638	601	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—LABETTE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	57,537	621,396	\$260,986 32	51,004	1,077,186	\$430,874 40
Spring wheat.....bu.	90	.....	.....	.....	.....	.....
Corn.....bu.	43,207	820,933	229,861 24	48,303	1,449,090	478,199 70
Oats.....bu.	30,667	858,676	171,735 20	33,459	632,367	183,386 43
Rye.....bu.	537	6,444	2,770 92	306	5,202	2,080 80
Barley.....bu.	9	.....	.....	15	150	60 00
Buckwheat.....bu.	2	16	12 00	5	40	24 00
Irish potatoes.....bu.	407	16,280	11,396 00	635	50,800	25,400 00
Sweet potatoes.....bu.	78	5,850	5,850 00	85	8,075	4,037 50
Castor beans.....bu.	747	5,229	6,013 35	804	8,040	8,040 00
Sorghum.....bu.	360	.....	6,930 00	510	.....	10,877 60
Cotton.....lbs.	.....	.....	.....	1	200	12 00
Flax.....bu.	2,088	18,792	15,973 20	3,158	22,106	22,106 00
Tobacco.....lbs.	2	.....	.....	14	8,400	840 00
Broom corn.....lbs.	50	20,000	600 00	97	29,100	1,018 00
Millet and hungarian.....tons	1,052	1,578	7,890 00	1,043	1,043	5,215 00
Milo maize.....tons	8	32	112 00	3	75	33 75
Kafir corn.....tons	41	164	574 00	242	4,840	2,420 00
Jerusalem corn.....tons	2	4	12 00	.....	.....	.....
Timothy.....tons	10,508	.....	.....	13,499	.....	.....
Clover.....tons	1,175	.....	.....	710	.....	.....
Blue grass.....tons	1,369	* 8,915	53,490 00	1,710	† 7,923	47,538 00
Alfalfa.....tons	24	.....	.....	56	.....	.....
Orchard grass.....tons	13	.....	.....	20	.....	.....
Other tame grasses.....tons	780	.....	.....	2,854	.....	.....
Prairie grass, fenced.....tons	27,770	15,448	54,068 00	29,288	12,041	48,164 00
Totals.....	178,523	.....	\$828,274 23	187,821	.....	\$1,270,327 68

Wheat on hand March 1, 1893, 43,452 bushels; March 1, 1894, 72,826 bushels.

Corn on hand March 1, 1893, 123,771 bushels; March 1, 1894, 87,326 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

eastern and western portions. Bottoms average from one fourth to three miles in width, and in the aggregate comprise 20 per cent. of the county area. Timber belts are from one-half to two miles in width and contain the following varieties of trees: Hackberry, cottonwood, willow, the different varieties of oak, sycamore, box elder, pecan, mulberry, black walnut, red and white elm, hickory, basswood, birch, maple, and coffee bean. The Neosho and Labette rivers and their tributaries supply the county liberally with water courses. Springs are numerous, and well water is reached at an average depth of 30 feet.

Limestone, sandstone and a superior quality of limestone flagging are extensively distributed throughout the county. Cement is found between Oswego and the Indian Territory. Clay, from which large quantities of brick are manufactured, is found on the Neosho and Labette rivers, at Oswego and Parsons. Salt water is found, by boring, all over the southwest part of the county.

SUMMARY.—LABETTE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	178,523	\$828,274 23	187,821	\$1,270,327 68
Animals slaughtered and sold for slaughter.....		278,213 00		408,773 00
Milk sold.....		1,209 00		561 00
Poultry and eggs sold.....		40,165 00		39,727 00
Wool clip.....lbs.	11,579	1,852 64	5,467	710 71
Cheese.....lbs.	9,130	1,004 30	7,955	954 60
Butter.....lbs.	437,727	70,036 32	361,561	57,849 76
Garden products marketed.....		11,952 00		8,705 00
Horticultural products.....		6,659 00		1,980 00
Honey and beeswax.....lbs.	12,512	2,256 08	3,026	546 92
Wine manufactured.....gals.	158	158 00	122	122 00
Wood marketed.....		1,166 00		1,215 00
Totals.....		\$1,242,945 57		\$1,791,472 67

LIVE STOCK.—LABETTE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,606	\$603,512 00	11,810	\$389,730 00
Mules and asses.....	1,344	83,328 00	1,221	51,282 00
Milch cows.....	7,476	149,520 00	6,707	147,554 00
Other cattle.....	11,608	197,336 00	8,614	155,052 00
Sheep.....	1,101	2,752 50	2,123	5,307 50
Swine.....	11,013	82,597 50	14,282	99,974 00
Totals.....	44,148	\$1,119,046 00	44,757	\$848,899 50

Number of dogs in county March 1, 1893, 2,606; March 1, 1894, 2,418.

Number of sheep killed by dogs, year ending March 1, 1894, 15.

Number of sheep killed by wolves, year ending March 1, 1894, 20.

LANE COUNTY.

Organized in 1886; has an area of 720 square miles, and ranks as the 91st county in population. Dighton, in the center, is the county seat.

The Chicago, Kansas & Western division of the Atchison, Topeka & Santa Fé railroad crosses the county in the central portion from east to west, and the Denver, Memphis & Atlantic, of the Missouri Pacific system, crosses the northern portion in the same direction.

POPULATION AND VALUATION.—LANE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,073	1,793	\$528,709	\$41,889	\$37,947	\$255,431	\$863,977
Alamota twp.....	189	126	\$61,880	\$1,345	\$145	\$38,606	\$101,976
Blaine twp.....	321	238	60,835	3,012	144	36,353	100,344
Cheyenne twp.....	247	246	54,539	4,970	1,273	48,251	109,033
Cleveland twp.....	94	99	58,020	2,289	160	.....	60,469
Dighton city.....	303	248	71,090	20,780	35,672	39,963	167,505
Dighton twp.....	220	192	.....	.....	.....	.....	.....
Spring Creek twp....	127	123	53,020	1,694	.....	.....	54,714
Sutton twp.....	108	85	52,530	2,717	.....	.....	55,247
White Rock twp.....	301	270	54,695	1,948	.....	45,990	102,633
Wilson twp.....	163	166	62,100	3,134	553	46,269	112,056

FARM AND CROP STATISTICS.—LANE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	37,505	.....	.....	41,956	94,401	\$33,040 35
Spring wheat.....bu.	212	.....	.....	51	.....	.....
Corn.....bu.	2,856	.....	.....	2,408	.....	.....
Oats.....bu.	1,937	.....	.....	1,537	3,928	1,178 40
Rye.....bu.	955	.....	.....	476	2,380	952 00
Barley.....bu.	9,261	.....	.....	6,624	59,616	22,057 92
Buckwheat.....bu.	2	.....	.....	.....	.....	.....
Irish potatoes.....bu.	134	.....	.....	114	1,140	1,140 00
Sweet potatoes.....bu.	2	100	\$100 00	4	80	80 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	2,967	.....	15,720 00	3,288	.....	17,415 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	250	125,000	3,125 00	612	183,600	5,508 00
Millet and hungarian, tons	168	336	1,680 00	373	187	935 00
Milo maize.....tons	49	† 122	427 00	7	70	31 50
Kaffir corn.....tons	441	† 882	3,087 00	310	3,100	1,550 00
Jerusalem corn.....tons	171	† 257	771 00	355	3,550	1,775 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	4	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	57	* 62	372 00	109	† 643	3,858 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	5,683	1,207	6,638 50	5,063	1,274	3,822 00
Totals.....	62,620	.....	\$31,920 50	63,291	.....	\$93,343 17

Wheat on hand March 1, 1893, 19,279 bushels; March 1, 1894, 190 bushels.

Corn on hand March 1, 1893, 1,543 bushels; March 1, 1894, 20 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface is a rolling prairie. Bottom lands average one-half of a mile in width, comprising about 8 per cent. of the entire area. A few small streams have their sources within the county. There is but very little timber in the county.

White limestone in small quantities is found in the bluffs on some of the creeks. Gypsum is found in all portions, in veins of from five to 20 feet below the surface.

SUMMARY.—LANE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	62,620	\$31,920 50	63,291	\$93,343 17
Animals slaughtered and sold for slaughter.....		119,469 00		16,046 00
Milk sold.....		1,207 00		664 00
Poultry and eggs sold.....		3,461 00		2,382 00
Wool clip.....lbs.	3,426	548 16	3,680	478 40
Cheese.....lbs.	150	16 50	300	36 00
Butter.....lbs.	45,823	7,331 68	48,027	7,684 32
Garden products marketed.....		1,151 00		3,490 00
Horticultural products.....		2,464 00		50 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	132	132 00		
Wood marketed.....				
Totals.....		\$167,700 84		\$124,173 89

LIVE STOCK.—LANE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,163	\$112,476 00	2,234	\$73,722 00
Mules and asses.....	159	9,858 00	171	7,182 00
Milch cows.....	1,441	28,820 00	985	21,670 00
Other cattle.....	2,587	43,979 00	2,293	41,274 00
Sheep.....	300	750 00	301	752 50
Swine.....	490	3,675 00	444	3,108 00
Totals.....	7,140	\$199,558 00	6,428	\$147,708 50

Number of dogs in county March 1, 1893, 322; March 1, 1894, 206.

Number of sheep killed by wolves, year ending March 1, 1894, 25.

LEAVENWORTH COUNTY.

One of the oldest counties, having been organized in 1855, before Kansas was made a state. It ranks as the fourth county in population, and has a territory of 455 square miles. The city of Leavenworth, lying on the Missouri river, in the northeastern portion, is the county seat. The state penitentiary, the national soldiers' home and the United States fort are located near the city. Tonganoxie, in the southwestern portion, is a town of much local importance. There are several other towns in the county, commanding the trade of their respective neighborhoods.

The Missouri Pacific and the Chicago, Rock Island & Pacific railroads, as well as branches of the Union Pacific and Atchison, Topeka & Santa Fé systems, have their extensions in the county.

POPULATION AND VALUATION.—LEAVENWORTH COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	32,854	33,216	\$2,432,580	\$1,160,841	\$4,678,550	\$1,119,459	\$9,391,430
Alexandria twp.....	1,027	1,009	\$195,990	\$14,570	\$1,930	\$14,335	\$226,825
Lansing city.....	544 } 2,004	577 } 1,871	307,490	25,025	24,090	209,699	566,304
Delaware twp.....	1,460	1,294					
Easton twp.....	951	1,250	180,450	12,960	2,980	54,207	250,597
Fairmount twp.....	1,052	877	232,120	29,887	8,070	87,879	357,956
High Prairie twp....	1,114	1,200	281,390	21,462		28,504	331,356
Kickapoo twp.....	1,522	1,319	284,580	114,450	8,260	210,379	617,669
Reno twp.....	863	859	181,230	22,365	2,770	118,924	325,289
Stranger twp.....	990	997	243,700	19,110		70,190	333,000
Linwood city.....	273 } 1,258	323 } 1,229	192,860	10,502	8,960	128,922	341,244
Sherman twp.....	985	906					
Tonganoxie city.....	776 } 2,046	767 } 2,139	199,100	26,650	49,600	71,385	346,735
Tonganoxie twp.....	1,270	1,372					
Leavenworth city:							
1st ward.....	3,218	3,156					
2d ward.....	2,860	2,951					
3d ward.....	3,320	3,449					
4th ward.....	2,823	2,875	133,670	863,860	4,571,890	125,035	5,694,455
5th ward.....	3,134	3,357					
6th ward.....	4,672	4,678					

FARM AND CROP STATISTICS.—LEAVENWORTH COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	33,772	472,808	\$274,228 64	27,270	446,670	\$192,068 10
Spring wheat.....bu.	104					
Corn.....bu.	49,688	1,341,576	402,472 80	54,165	1,029,135	411,654 00
Oats.....bu.	10,307	206,140	53,596 40	9,787	135,639	40,691 70
Rye.....bu.	635			444	9,768	2,930 40
Barley.....bu.	7					
Buckwheat.....bu.	30	300	225 00			
Irish potatoes.....bu.	3,617	318,296	149,599 12	5,138	400,764	180,343 80
Sweet potatoes.....bu.	109	5,450	5,450 00	127	5,080	1,778 00
Castor beans.....bu.						
Sorghum.....	492		18,805 00	1,446		50,245 00
Flax.....bu.	112	1,008	856 80	177	1,593	1,593 00
Tobacco.....lbs.						
Broom corn.....lbs.	20	12,000	240 00	1	300	10 50
Millet and hungarian, tons	979	1,713	6,852 00	1,393	1,741	8,705 00
Milo maize.....tons				5	† 100	45 00
Kafir corn.....tons	13	† 52	182 00	4	100	50 00
Jerusalem corn.....tons						
Timothy.....tons	20,672			19,529		
Clover.....tons	2,067			2,166		
Blue grass.....tons	24,288			26,641		
Alfalfa.....tons	83	* 20,243	121,458 00	34	† 21,891	131,346 00
Orchard grass.....tons	16			34		
Other tame grasses.....tons	10,229			8,356		
Prairie grass, fenced..tons	18,588	7,521	37,605 00	14,201	7,100	49,700 00
Totals.....	175,828		\$1,071,570 76	170,918		\$1,071,160 50

Wheat on hand March 1, 1893, 131,769 bushels; March 1, 1894, 100,863 bushels.

Corn on hand March 1, 1893, 364,583 bushels; March 1, 1894, 404,615 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

The general surface is undulating, the eastern portion, along the Missouri river, being hilly and broken, while the west and southwest is a rolling prairie. Bottom lands average one mile in width, and comprise 25 per cent. of the entire area.

All the kinds of limestone and great quantities of sandstone are found in all sections, and extensively used in the manufacture of lime and for building purposes. Gray limestone is quarried on the bluffs and hills, while the blue is found on the lower lands. Small veins of red and yellow ocher are found south of the city of Leavenworth. In the southwest and west a good quality of cement is found and extensively used. A good quality of potters' clay is found in several localities. A large area of bituminous coal is mined at a depth of 700 feet at Leavenworth and Lansing. At the state penitentiary, a shaft is in extensive operation, the work being done by convict labor. This shaft furnishes coal to all the state institutions, the state capitol, and the several asylums. There are three shafts in operation at the city of Leavenworth, giving employment to a great number of miners. A magnificent bridge is built across the Missouri at this point.

SUMMARY.—LEAVENWORTH COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	175,828	\$1,071,570 76	170,919	\$1,071,160 50
Animals slaughtered and sold for slaughter.....		440,406 00		421,441 00
Milk sold.....		27,117 00		17,414 00
Poultry and eggs sold.....		32,104 00		40,613 00
Wool clip.....lbs.	6,320	1,011 20	8,127	1,056 51
Cheese.....lbs.			90	10 80
Butter.....lbs.	364,231	58,276 96	413,860	66,217 60
Garden products marketed.....		40,656 00		36,332 00
Horticultural products.....		10,060 00		14,632 00
Honey and beeswax.....lbs.	14,225	2,583 04	5,644	1,017 42
Wine manufactured.....gals.	20,084	20,084 00	23,683	23,683 00
Wood marketed.....		11,580 00		8,720 00
Totals.....		\$1,715,448 96		\$1,702,297 83

LIVE STOCK.—LEAVENWORTH COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,359	\$538,668 00	10,188	\$336,204 00
Mules and asses.....	1,439	89,218 00	1,680	70,560 00
Milch cows.....	7,267	145,340 00	7,054	155,188 00
Other cattle.....	12,102	205,734 00	11,540	207,720 00
Sheep.....	1,212	3,030 00	1,298	3,245 00
Swine.....	14,609	109,567 50	18,358	128,506 00
Totals.....	46,988	\$1,091,557 50	50,118	\$1,901,423 00

Number of dogs in county March 1, 1893, 3,074; March 1, 1894, 2,738.

Number of sheep killed by dogs, year ending March 1, 1894, 4.

Number of sheep killed by wolves, year ending March 1, 1894, 10.

LINCOLN COUNTY.

It has an area of 720 square miles, ranks as the 61st county in population, and was organized in 1870. Lincoln, three miles east of the center, is the county seat.

The Union Pacific, Lincoln & Colorado railroad, operated by the Union Pacific, extends across the central portion of the county from east to west.

The general surface is a gently undulating prairie, with bluffs and rough lands in the southern and eastern portions. The valleys of the rivers and creeks average a width of $1\frac{1}{2}$ miles, and, in the aggregate, make about 15 per cent. of the county area. Timber is very scarce, the belts on the streams in some places being one-half mile in width, while in most cases they are but a mere fringe. The varieties of trees found in these belts are: Cottonwood, ash, oak, elm, hackberry, walnut, box elder, and a few mulberry; the first-named variety is the most abundant.

A magnesian limestone of fine quality is found throughout the county, except in the eastern portion. Red and white sandstone have been found in large quantities in every portion, but have not been used to any extent. Mineral paint has been found in Cedron township and other portions of the county. Cement rock exists in the western part, but has not yet been developed. Fire and potters' clay are found in several localities, and are being utilized to some extent. Large salt marshes exist in the northeastern portion, one of them being 1,000 acres in extent. Salt springs abound along the Saline river, and Spillman creek. A fair quality of coal is mined in several places for local use.

POPULATION AND VALUATION.—LINCOLN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	9,662	9,294	\$1,702,084	\$529,981	\$220,660	\$195,095	\$2,657,820
Battle Creek twp....	390	362	\$58,070	\$16,040	.....	.....	\$74,110
Beaver twp.....	301	427	68,710	12,140	.....	.....	80,850
Cedron twp.....	490	458	86,850	14,375	.....	.....	101,225
Beverly city.....	185 } 615	611	117,525	30,979	9,106	32,229	189,839
Colorado twp.....	430 }						
Lincoln Centre city..	1,253 }	733 }	125,180	147,400	182,058	31,321	485,959
Elkhorn twp.....	644 } 1,897	541 }					
Franklin twp.....	452	503	81,550	26,150	.....	.....	107,700
Golden Belt twp....	307	323	65,610	9,800	.....	.....	75,410
Grant twp.....	466	470	92,335	23,295	.....	.....	116,230
Hanover twp.....	344	349	87,965	12,605	.....	.....	100,570
Highland twp.....	311	298	56,945	8,725	.....	.....	65,670
Indiana twp.....	505	676	62,884	19,335	.....	32,296	114,515
Logan twp.....	390	356	81,026	16,240	.....	.....	97,266
Madison township...	310	339	74,195	11,341	.....	.....	85,536
Marion twp.....	359	414	76,020	11,520	.....	.....	87,540
Orangetwp.....	497	481	89,175	30,125	.....	.....	119,300
Sylvan Grove city...	196 }						
Pleasant twp.....	310 }	563	109,793	47,960	17,166	35,121	210,040
Salt Creek twp.....	458	419	95,326	15,780	.....	26,762	137,868
Barnard city.....	95 }	386	115,535	39,276	12,330	4,883	172,024
Scott twp.....	369 }						
Valley twp.....	248	245	63,155	11,100	.....	.....	74,255
Vesper twp.....	352	340	103,635	25,795	.....	32,483	161,913

FARM AND CROP STATISTICS.—LINCOLN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	92,298	99,680	\$42,862 40	93,620	486,824	\$189,861 36
Spring wheat.....bu.	76					
Corn.....bu.	47,461	616,993	197,437 76	39,943	159,772	70,299 68
Oats.....bu.	9,650			3,578	3,220	1,191 40
Rye.....bu.	2,102	10,510	4,204 00	676	5,408	1,892 80
Barley.....bu.	95			2	8	3 20
Buckwheat.....bu.						
Irish potatoes.....bu.	567	13,041	12,388 95	550	7,700	7,084 00
Sweet potatoes.....bu.	19	608	608 00	13	1,300	910 00
Castor beans.....bu.						
Sorghum.....bu.	2,554		16,596 00	3,854		22,175 80
Flax.....bu.	30	120	102 00	25	75	75 00
Tobacco.....lbs.						
Broom corn.....lbs.	48	24,000	720 00	12		
Millet and hungarian.....tons	764	1,146	4,584 00	281	281	1,405 00
Milo maize.....tons	106	‡	318	210	3,150	1,417 50
Kaffir corn.....tons	1,099	‡	3,297	4,010	40,100	20,050 00
Jerusalem corn.....tons	14	‡	28	5	50	25 00
Timothy.....tons	14					
Clover.....tons	26					
Blue grass.....tons		* 1,829	10,974 00	507	† 803	4,818 00
Alfalfa.....tons	555			3		
Orchard grass.....tons	29			15		
Other tame grasses.....tons						
Prairie grass, fenced.....tons	65,988	10,470	34,027 50	55,558	13,911	41,733 00
Totals.....	223,495		\$337,240 61	202,862		\$362,941 74

Wheat on hand March 1, 1893, 292,206 bushels; March 1, 1894, 99,803 bushels.

Corn on hand March 1, 1893, 209,465 bushels; March 1, 1894, 123,630 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—LINCOLN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	223,495	\$337,240 61	202,862	\$362,941 74
Animals slaughtered and sold for slaughter.....		417,561 00		362,477 00
Milk sold.....		3,016 00		20 00
Poultry and eggs sold.....		50,288 00		50,071 00
Wool clip.....lbs.	10	1 60	30	3 90
Cheese.....lbs.	410	45 10	350	42 00
Butter.....lbs.	255,974	40,955 84	270,016	43,202 56
Garden products marketed.....		1,049 00		542 00
Horticultural products.....		530 00		150 00
Honey and beeswax.....lbs.	100	18 00	24	4 32
Wine manufactured.....gals.	3,053	3,053 00	987	987 00
Wood marketed.....		715 00		422 00
Totals.....		\$854,473 15		\$820,863 52

LIVE STOCK.—LINCOLN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	8,866	\$461,032 00	8,111	\$267,663 00
Mules and asses.....	633	39,246 00	600	25,200 00
Milch cows.....	5,360	107,200 00	4,712	103,664 00
Other cattle.....	20,310	345,270 00	14,448	260,064 00
Sheep.....	10	25 00	8	20 00
Swine.....	8,121	60,907 50	8,782	61,474 00
Totals.....	43,300	\$1,013,680 50	36,661	\$718,085 00

Number of dogs in county March 1, 1893, 1,521; March 1, 1894, 1,523.

LINN COUNTY.

It was organized in 1855, has an area of 637 square miles, and ranks as 38th in population. Mound City, south and east of the center, is the county seat. The cities of Pleasanton, in the east-central portion, and La Cygne, in the northeastern, are places of importance, and do a large trade with the surrounding country.

POPULATION AND VALUATION.—LINN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	15,466	15,215	\$2,128,212	\$567,755	\$338,517	\$644,646	\$3,678,532
Blue Mound city ...	675 } 1,477	606 } 1,413	\$210,850	\$53,670	\$43,470	\$82,293	\$390,283
Blue Mound twp.	802 }	807 }					
Centerville twp.	1,503	1,487	265,710	54,575	3,320	61,410	385,015
Liberty twp.	1,384	1,306	225,482	51,755	12,519	56,463	346,219
La Cygne city	986 }	893 }					
Lincoln twp.	926 }	815 }	189,205	82,225	77,415	47,610	396,455
Mound City	771 }	757 }					
Mound City twp.	857 }	861 }	183,335	97,915	83,720	39,020	403,990
Paris twp.	1,248	1,267	212,715	24,985	.....	6,883	243,983
Pleasanton city	1,118 }	1,302 }	213,845	82,265	95,610	134,354	526,074
Potosi twp.	1,546 }	1,703 }					
Scott twp.	1,082	1,024	213,345	42,900	.....	38,703	294,948
Sheridan twp.	1,053	1,083	163,605	41,095	14,480	106,245	325,425
Stanton twp.	556	535	110,680	17,085	.....	18,543	146,308
Valley twp.	959	769	139,440	19,285	7,983	53,124	219,832

FARM AND CROP STATISTICS.—LINN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat. bu.	13,621	198,180	\$99,090 00	12,200	150,060	\$61,524 60
Spring wheat. bu.	125	1,180	472 00	40	.....	.....
Corn. bu.	78,772	1,654,212	479,721 48	80,763	1,696,023	610,568 28
Oats. bu.	22,570	564,250	118,492 50	33,777	891,690	231,839 40
Rye. bu.	207	3,105	1,304 10	150	2,550	1,122 00
Barley. bu.	23	.....	.....	8	80	33 60
Buckwheat. bu.	51	510	382 50	5	40	24 00
Irish potatoes. bu.	642	41,730	25,038 00	967	48,350	29,977 00
Sweet potatoes. bu.	11	660	660 00	10	500	360 00
Castor beans. bu.	82	656	754 40	137	1,096	1,096 00
Sorghum. bu.	270	.....	8,056 00	557	.....	18,360 00
Flax. bu.	4,318	30,226	25,692 10	5,203	52,030	52,030 00
Tobacco. lbs.	1	.....	.....	2	1,200	120 00
Broom corn. lbs.	22	11,000	275 00	20	8,000	280 00
Millet and hungarian, tons	1,945	3,403	13,612 00	1,701	2,551	10,204 00
Milo maize. tons	36	† 144	504 00	36	720	324 00
Kaffir corn. tons	5	† 20	70 00	12	300	150 00
Jerusalem corn. tons	1	† 2	6 00	2	40	20 00
Timothy. tons	33,260	.....	.....	33,264	.....	.....
Clover. tons	3,216	.....	.....	3,053	.....	.....
Blue grass. tons	53	* 16,530	99,180 00	1,031	.....	.....
Alfalfa. tons	17	.....	.....	24	† 27,176	163,056 00
Orchard grass. tons	5	.....	.....	42	.....	.....
Other tame grasses. tons	1,212	.....	.....	1,427	.....	.....
Prairie grass, fenced. tons	40,933	11,864	35,592 00	40,272	14,440	57,760 00
Totals.	201,878	.....	\$908,902 08	214,703	.....	\$1,238,848 88

Wheat on hand March 1, 1893, 1,703 bushels; March 1, 1894, 21,594 bushels.

Corn on hand March 1, 1893, 303,319 bushels; March 1, 1894, 243,937 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

The railroads in the county are: The Kansas City & Pacific, operated by the Missouri, Kansas & Texas; Missouri Pacific, and the Fort Scott & Memphis.

The general surface is a rolling prairie, rather broken in the eastern portion. About 10 per cent. of the county is too rough to admit of cultivation. Bottom lands cover about 20 per cent. of the county area, and average from one-half to two miles in width. The county is very well supplied with timber, it not all being confined to the streams. All of the varieties native to the Western states are found here.

Limestone, both common and magnesian, and a superior quality of sandstone, good for flagging, are found in several localities, large quarries being in operation at Pleasanton and Barnard. Fire clay is found at the bottom of coal veins, but no use has been made of it as yet. A salt mineral spring exists at Mound City. There are several coal shafts in operation in the county, the one supplying the largest product being located at the town of Boicourt. A vein three feet in thickness and 110 feet below the surface is supplying that portion of the county with good coal. Cement rock abounds in large quantities, but has not yet been utilized. Extensive beds of fire clay underlie the coal beds in Potosi and Sheridan townships.

A number of coal shafts have been opened up in Potosi township, and a large supply of coal is shipped from there to points in western Kansas.

SUMMARY.—LINN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	201,878	\$908,902 08	214,703	\$1,238,848 88
Animals slaughtered and sold for slaughter.....		467,375 00		506,582 00
Milk sold.....		182 00		252 00
Poultry and eggs sold.....		37,747 00		48,294 00
Wool clip.....lbs.	2,880	460 80	3,215	417 95
Cheese.....lbs.	900	99 00	900	108 00
Butter.....lbs.	329,088	52,654 08	369,395	59,103 20
Garden products marketed.....		2,787 00		2,461 00
Horticultural products.....		690 00		181 00
Honey and beeswax.....lbs.	3,155	570 14	3,266	588 38
Wine manufactured.....gals.	30	30 00		
Wood marketed.....		1,190 00		25 00
Totals.....		\$1,472,687 10		\$1,856,861 41

LIVE STOCK.—LINN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,093	\$576,836 00	9,773	\$322,509 00
Mules and asses.....	1,609	99,758 00	1,866	78,372 00
Milch cows.....	6,048	120,960 00	7,327	161,194 00
Other cattle.....	15,629	265,693 00	14,384	258,912 00
Sheep.....	886	2,215 00	362	905 00
Swine.....	15,007	112,552 50	20,309	142,163 00
Totals.....	50,272	\$1,178,014 50	54,021	\$964,055 00

Number of dogs in county March 1, 1893, 1,715; March 1, 1894, 1,915.

Number of sheep killed by dogs, year ending March 1, 1894, 8.

Number of sheep killed by wolves, year ending March 1, 1894, 3.

LOGAN COUNTY.

Was organized in 1888; ranks as the 85th county in population. Russell Springs, near the center, is the county seat.

The Union Pacific railroad enters on the northeastern corner of the county, crosses the northern portion, and leaves it about twelve miles south of the northern border.

POPULATION AND VALUATION.—LOGAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	2,933	2,603	\$941,490	\$52,971	\$55,971	\$331,154	\$1,381,586
Augustine twp.	134	132	\$52,300	\$3,126	\$3,517	.....	\$58,943
Elkader twp.	187	131	69,050	2,080	1,274	.....	72,404
Lees twp.	89	76	26,550	367	.....	.....	26,917
Logansport twp.	143	141	90,440	1,491	.....	.....	91,931
McAllaster twp.	214	198	96,080	4,615	3,068	\$77,009	180,772
Monument twp.	426	350	120,220	7,355	4,098	79,315	210,988
Oakley city	202 } 563	153 } 482	124,970	15,674	19,353	87,689	247,686
Oakley twp.	361 }	329 }					
Paxton twp.	223	194	42,660	1,156	.....	.....	43,816
Russell Springs city..	76 } 273	122 } 308	95,900	8,185	13,756	.....	117,841
Russell Springs twp..	197 }	186 }					
Western twp.	261	217	94,080	1,869	1,170	4,253	101,372
Winona twp.	420	374	129,240	7,053	9,735	82,888	228,916

FARM AND CROP STATISTICS.—LOGAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	58,622	.....	.....	58,397	5,838	\$2,451 96
Spring wheat.....bu.	2,728	1,632	\$652 80	2,361	918	394 74
Corn.....bu.	10,450	31,350	14,107 50	8,480	42,400	21,200 00
Oats.....bu.	5,135	.....	.....	3,351	1,675	670 00
Rye.....bu.	2,444	.....	.....	1,127	2,254	1,014 30
Barley.....bu.	6,956	6,956	2,921 52	4,045	24,270	10,921 50
Buckwheat.....bu.	1	.....	.....	.....	.....	.....
Irish potatoes.....bu.	153	2,295	2,295 00	252	5,040	4,384 80
Sweet potatoes.....bu.	1	.....	.....	4	160	160 00
Castor beans.....bu.	15	45	51 75	.....	.....	.....
Sorghum.....bu.	3,484	.....	28,912 00	4,473	.....	26,388 00
Flax.....bu.	10	30	25 50	1	.....	.....
Tobacco.....lbs.	.....	.....	.....	1	300	30 00
Broom corn.....lbs.	834	250,200	6,255 00	763	.....	.....
Millet and hungarian..tons	860	1,720	5,160 00	1,757	879	4,395 00
Milo maize.....tons	128	† 128	448 00	231	2,310	1,039 50
Kaffir corn.....tons	282	† 423	1,481 00	419	8,380	4,190 00
Jerusalem corn.....tons	407	† 407	1,221 00	574	5,740	2,870 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	39	* 114	684 00	4	† 557	3,342 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	4	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	4,037	1,746	9,603 00	2,534	2,060	10,300 00
Totals.....	96,590	.....	\$73,818 07	88,774	.....	\$93,751 80

Wheat on hand March 1, 1893, 32,448 bushels; March 1, 1894, 5,335 bushels.

Corn on hand March 1, 1893, 12,211 bushels; March 1, 1894, 1,309 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface is undulating, some portions being nearly level, while a very small proportion is rough and bluffy. A few scattering trees are met with along the banks of the Smoky Hill river and Hackberry creek, the quantity of timber in the county being very small. Springs are rarely met with, except along south side of county, where they are numerous, and well water is reached at an average depth of 30 feet. The Smoky Hill river enters the county on the west, a little south of the center, and flows south of east, leaving it on its eastern border six miles north of the southeastern corner. Twin Butte creek flows east in the southern portion, and, after receiving Hackberry creek from the southwest and Ladder creek from the south, empties into the Smoky Hill. There are several other small streams in the county.

SUMMARY.—LOGAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	96,590	\$73,818 07	88,774	\$93,751 80
Animals slaughtered and sold for slaughter.....		26,872 00		35,723 00
Milk sold.....		50 00		190 00
Poultry and eggs sold.....		4,718 00		4,771 00
Wool clip.....lbs.	11,630	1,860 80	17,604	2,288 52
Cheese.....lbs.	1,595	175 45	2,030	243 60
Butter.....lbs.	59,744	9,559 04	58,718	9,394 88
Garden products marketed.....		1,176 00		1,614 00
Horticultural products.....		14 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	35	35 00		
Wood marketed.....				
Totals.....		\$118,278 36		\$147,976 80

LIVE STOCK.—LOGAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,973	\$154,596 00	3,199	\$105,567 00
Mules and asses.....	312	19,344 00	291	12,222 00
Milch cows.....	1,497	29,940 00	1,201	26,422 00
Other cattle.....	3,247	55,199 00	1,963	35,334 00
Sheep.....	2,845	7,112 50	3,479	8,697 50
Swine.....	886	6,645 00	657	4,599 00
Totals.....	11,760	\$272,836 50	10,790	\$192,841 50

Number of dogs in county March 1, 1893, 346; March 1, 1894, 339.

LYON COUNTY.

It has an area of 858 square miles, was organized in 1858, and ranks as the 16th county in population. Emporia, lying between the Neosho and Cottonwood rivers, west and south of the center, is the county seat, and a place of much importance to that section of the state. The towns of Hartford, in the southeastern portion, and Americus, in the west central, each have a large local trade.

The Atchison, Topeka & Santa Fé, and its divisions, the Kansas City, Emporia & Southern, and Kansas City & Emporia; the Missouri, Kansas & Texas; the Council Grove, Osage City & Ottawa railroads, all have their extensions in the county.

Timber belts on the streams average one-half mile in width, and many groves of artificial forests are to be found on the uplands. The varieties of native trees are: Oak, walnut, hickory, red and white elm, hackberry, cottonwood, coffee bean, and

POPULATION AND VALUATION.—LYON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	22,619	23,625	\$3,394,909	\$1,317,653	\$1,819,056	\$874,858	\$7,406,476
Agnes City twp.	1,324	1,462	\$260,673	\$80,022	\$14,510	\$86,300	\$441,505
Americus city.....	408 } 1,831	472 } 1,935	368,662	74,725	41,369	57,485	542,241
Americus twp.	1,423 }	1,463 }					
Center twp.	1,351	1,381	298,489	70,575	9,834	52,770	431,668
Hartford city.....	401 } 1,983	502 } 2,251	401,840	109,855	9,215	10,488	571,398
Elmendorf twp.	1,582 }	1,749 }					
Emporia city.....	7,890 } 10,037	8,103 } 10,357	568,706	555,743	1,650,957	252,766	3,028,172
Emporia twp.	2,147 }	2,254 }					
Fremont twp.	1,083	1,161	298,390	66,836	.....	29,247	394,473
Ivy twp.	523	555	112,510	45,941	10,669	50,817	219,937
Jackson twp.	1,771	1,812	429,416	99,169	19,750	144,536	692,871
Pike twp.	924	829	235,561	56,761	6,028	80,745	379,095
Reading city.....	259 } 865	275 } 951	250,185	87,447	16,724	87,419	441,775
Reading twp.	606 }	676 }					
Waterloo twp.	927	931	170,477	70,579	.....	22,285	263,341

FARM AND CROP STATISTICS.—LYON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	8,849	80,522	\$38,650 56	5,385	69,564	\$31,999 44
Spring wheat.....bu.	192			51		
Corn.....bu.	93,925	3,099,525	867,867 00	118,393	1,065,537	500,802 39
Oats.....bu.	16,773	369,006	103,321 68	12,459	242,940	77,740 80
Rye.....bu.	863	8,630	3,710 90	366	5,124	2,305 80
Barley.....bu.	140			30	900	360 00
Buckwheat.....bu.	119	1,190	892 50	91	728	436 80
Irish potatoes.....bu.	937	70,275	54,111 75	1,586	187,982	75,890 10
Sweet potatoes.....bu.	281	28,100	28,100 00	57	5,700	5,700 00
Castor beans.....bu.						
Sorghum.....bu.	1,272		20,376 00	1,761		17,165 00
Flax.....bu.	798	7,182	6,104 70	712	7,832	7,832 00
Tobacco.....lbs.						
Broom corn.....lbs.	12	6,000	180 00	66	39,600	1,584 00
Millet and hungarian, tons	7,809	15,618	62,472 00	10,224	20,448	102,240 00
Milo maize.....tons	47	188	653 00	20	400	180 00
Kaffir corn.....tons	210	840	2,940 00	537	10,740	5,370 00
Jerusalem corn.....tons	4	8	24 00	16	320	160 00
Timothy.....tons	3,189			3,107		
Clover.....tons	2,007			1,774		
Blue grass.....tons	664	* 5,202	31,212 00	838	† 6,147	36,882 00
Alfalfa.....tons	1,408			1,617		
Orchard grass.....tons	258			204		
Other tame grasses.....tons	199			287		
Prairie grass, fenced.....tons	114,142	41,626	124,878 00	118,789	59,291	237,164 00
Totals.....	254,098		\$1,345,499 09	278,370		\$1,103,812 33

Wheat on hand March 1, 1893, 17,941 bushels; March 1, 1894, 21,971 bushels.

Corn on hand March 1, 1893, 593,168 bushels; March 1, 1894, 472,074 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

locust. Flowing springs are found in all portions of the county, and well water is reached at an average depth of 22 feet. The Neosho river crosses the county from northwest to southeast.

Blue limestone and white magnesian limestone are generally distributed over the county, and sandstone is found in the southern portion. Large quarries of magnesian limestone are located near the towns of Americus, Dunlap, and Bushong, quantities being shipped over the Missouri Pacific railroad to Kansas City from the last-named place. Fire clay is found in several localities lying under rocky ledges, and in large quantities beneath the bed of the Neosho river. Potters' clay of good quality is also found between the Neosho and Cottonwood.

SUMMARY.—LYON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	254,098	\$1,345,499 09	278,370	\$1,103,812 33
Animals slaughtered and sold for slaughter.....		936,851 00		210,710 00
Milk sold.....		14,744 00		13,872 00
Poultry and eggs sold.....		46,745 00		58,579 00
Wool clip.....lbs.	7,523	1,203 68	3,773	490 49
Cheese.....lbs.	45,215	4,973 65	18,350	2,202 00
Butter.....lbs.	329,192	52,670 72	397,975	63,676 00
Garden products marketed.....		14,602 00		15,995 00
Horticultural products.....		7,605 00		5,465 00
Honey and beeswax.....lbs.	10,674	1,938 12	7,830	1,412 86
Wine manufactured.....gals.	1,950	1,950 00	4,008	4,008 00
Wood marketed.....		2,121 00		1,743 00
Totals.....		\$2,430,903 26		\$1,481,965 68

LIVE STOCK.—LYON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,838	\$563,576 00	13,222	\$436,326 00
Mules and asses.....	1,001	62,062 00	1,197	50,274 00
Milch cows.....	7,713	154,260 00	9,106	200,332 00
Other cattle.....	31,470	534,990 00	37,136	668,448 00
Sheep.....	2,377	5,942 50	904	2,260 00
Swine.....	15,392	115,440 00	28,122	196,854 00
Totals.....	68,791	\$1,436,270 50	89,687	\$1,554,494 00

Number of dogs in county March 1, 1893, 2,173; March 1, 1894, 2,298.

Number of sheep killed by dogs, year ending March 1, 1894, 27.

Number of sheep killed by wolves, year ending March 1, 1894, 3.

MARION COUNTY.

It was organized in 1865, and has an area of 954 square miles; now ranks as the 22d in population. The city of Marion, situated east of the center and lying on the Cottonwood river, is the county seat. At Peabody, in the southwestern portion, the Kansas state silk station is located. Florence, a little southeast of Marion, is a railroad center of considerable importance, as are Hillsboro and Lehigh, in the west-

POPULATION AND VALUATION.—MARION COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	20,241	20,193	\$2,307,865	\$438,710	\$532,499	\$909,484	\$4,188,556
Blaine twp.....	363	399	\$80,725	\$7,775	\$846	\$19,797	\$109,143
Catlin twp.....	678	658	95,470	25,485	3,767	54,336	179,058
Marion city.....	1,952	2,162	126,860	53,160	212,053	75,948	468,021
Center twp.....	647 } 2,599	618 } 2,780	95,185	13,965	.....	.....	109,150
Clark twp.....	599	543	181,405	11,685	5,381	51,875	250,346
Clear Creek twp.....	1,015	1,025	94,300	9,300	1,767	45,785	151,152
Colfax twp.....	406	411	72,570	26,570	92,230	116,561	307,931
Florence city.....	1,442	1,539	93,625	11,350	3,856	34,866	143,697
Doyle twp.....	291 } 1,733	322 } 1,861	94,220	11,325	.....	.....	105,545
Durham Park twp.....	567	434	98,600	17,450	2,338	114,025	232,413
East Branch twp.....	555	557	91,045	18,430	1,170	24,200	134,845
Fair Play twp.....	461	410	147,215	13,955	.....	.....	161,170
Gale twp.....	709	693	75,000	13,210	11,802	55,507	155,519
Grant twp.....	637	629	91,840	14,295	.....	.....	105,635
Lehigh twp.....	878	893	72,040	1,685	.....	.....	73,725
Liberty twp.....	1,050	1,053	93,120	22,715	6,507	70,232	192,574
Logan twp.....	572	557	92,420	12,180	.....	.....	104,600
Lost Springs twp.....	557	594	55,680	17,200	12,636	36,766	122,282
Menno twp.....	748	761	78,585	3,410	.....	21,183	103,178
Milton twp.....	452	462	.....	.....	.....	.....	.....
Moore twp.....	301	296	101,595	72,685	139,802	119,230	433,312
Peabody city.....	1,478	1,391	93,150	23,155	37,527	31,831	185,661
Peabody twp.....	494 } 1,972	426 } 1,817	87,225	11,235	.....	2,438	100,898
Hillsboro city.....	618	630	97,650	11,165	.....	.....	108,815
Risley twp.....	734 } 1,352	672 } 1,302	98,840	15,325	817	34,904	149,886
Summit twp.....	465	489	.....	.....	.....	.....	.....
West Branch twp.....	769	800	.....	.....	.....	.....	.....
Wilson twp.....	803	769	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—MARION COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	80,373	600,381	\$270,171 45	106,739	1,114,344	\$456,881 04
Spring wheat.....bu.	23	160	72 00	48	288	106 56
Corn.....bu.	91,080	1,548,360	433,540 80	98,872	988,720	444,924 00
Oats.....bu.	44,881	673,215	154,839 45	39,363	590,440	165,323 20
Rye.....bu.	3,038	30,380	12,152 00	2,676	24,084	10,837 80
Barley.....bu.	299	4,485	1,794 00	252	5,040	2,016 00
Buckwheat.....bu.	4	32	24 00	3	24	14 40
Irish potatoes.....bu.	1,340	53,600	48,240 00	1,284	51,360	43,656 00
Sweet potatoes.....bu.	26	1,820	1,820 00	5	225	193 50
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	2,836	.....	22,426 00	5,376	.....	33,330 00
Flax.....bu.	1,829	12,803	10,882 55	1,025	8,200	8,200 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	2,042	1,123,100	33,693 00	1,123	561,500	19,652 50
Millet and hungarian, tons	3,305	5,783	23,132 00	5,477	10,954	43,816 00
Milo maize.....tons	40	† 160	560 00	7	140	63 00
Kaffir corn.....tons	39	† 156	546 00	274	5,480	2,740 00
Jerusalem corn.....tons	.....	.....	.....	1	† 8	4 00
Timothy.....tons	1,887	.....	.....	640	.....	.....
Clover.....tons	1,112	.....	.....	229	.....	.....
Blue grass.....tons	274	* 4,880	29,280 00	236	† 2,960	17,760 00
Alfalfa.....tons	2,226	.....	.....	3,048	.....	.....
Orchard grass.....tons	143	.....	.....	37	.....	.....
Other tame grasses.....tons	249	.....	.....	190	.....	.....
Prairie grass, fenced..tons	77,612	46,782	222,214 50	74,800	23,751	71,253 00
Totals.....	314,158	.....	\$1,265,387 75	341,705	.....	\$1,320,771 00

Wheat on hand March 1, 1893, 291,884 bushels; March 1, 1894, 166,852 bushels.

Corn on hand March 1, 1893, 513,795 bushels; March 1, 1894, 117,633 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

central portion, and Lincolnville and Lost Springs, in the northeast. Burns, in the extreme southeast, is a great hay and stock center.

The railroads in the county are: The Atchison, Topeka & Santa Fé, and its members, the Florence, El Dorado & Walnut Valley, Marion & McPherson, and Chicago, Kansas & Western; and the Chicago, Rock Island & Pacific system.

The eastern portion is somewhat hilly and broken, while the western is a gently rolling prairie. The bottom lands on the Cottonwood river average about one mile in width, while those on the smaller streams are from one-fourth to one-half mile wide. Timber belts are very narrow, and contain the following varieties of trees: Cottonwood, hackberry, elm, oak, walnut, box elder, sycamore, honey locust, coffee bean, and mulberry.

A magnesian limestone of excellent quality is found and quarried at Marion and Florence. The product of these quarries not only supplies the home demand, but is shipped to various parts of the state; this stone is also found on Doyle and Luta creeks, and on the banks of the Cottonwood. Gypsum is found in large quantities in the western portion, and has been manufactured, at Peabody, into stucco, cement, and fertilizer. Fire clay has been discovered near Marion.

SUMMARY.—MARION COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	314,158	\$1,265,387 75	341,705	\$1,320,771 00
Animals slaughtered and sold for slaughter.....		837,243 00		839,460 00
Milk sold.....		10,339 00		14,012 00
Poultry and eggs sold.....		69,549 00		80,996 00
Wool clip.....lbs.	43,515	6,962 40	34,167	4,441 71
Cheese.....lbs.	9,087	999 57	930	111 60
Butter.....lbs.	368,252	58,920 32	394,865	63,178 40
Garden products marketed.....		6,085 00		4,234 00
Horticultural products.....		69,173 00		57,288 00
Honey and beeswax.....lbs.	1,095	198 99	243	43 74
Wine manufactured.....gals.	12,857	12,857 00	11,388	11,388 00
Wood marketed.....		540 00		250 00
Totals.....		\$2,338,255 03		\$2,396,174 45

LIVE STOCK.—MARION COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	13,025	\$677,300 00	12,742	\$420,486 00
Mules and asses.....	512	31,744 00	622	26,124 00
Milch cows.....	9,369	187,380 00	8,789	193,358 00
Other cattle.....	28,903	491,351 00	23,102	415,836 00
Sheep.....	7,498	18,745 00	2,441	6,102 50
Swine.....	20,132	150,990 00	21,332	149,324 00
Totals.....	79,439	\$1,557,510 00	69,028	\$1,211,230 50

Number of dogs in county March 1, 1893, 2,639; March 1, 1894, 2,491.

Number of sheep killed by dogs, year ending March 1, 1894, 9.

Number of sheep killed by wolves, year ending March 1, 1894, 3.

MARSHALL COUNTY.

Was organized in 1855, under the territorial government; contains an area of 900 square miles, and now ranks as the 12th county in population in the state. Marysville, north and west of the center, is the county seat. Blue Rapids, on the Blue river, in the southwestern portion, is an important place, having several plaster of Paris factories in active operation. There are several other cities and towns in the county, all of which do a thriving business with the surrounding country.

The Kansas City, Wyandotte & Northwestern railroad, the Omaha & Republican Valley, and the St. Joseph & Grand Island, divisions of the Union Pacific system; the Central Branch Union Pacific, and the Atchison, Colorado & Pacific, of the Missouri Pacific, have their extensions in the county.

Bluffs occur along all the streams, while the remainder of the county is an undulating prairie. Bottom lands comprise 20 per cent. of the total area, and are from one-half to one mile in width. Timber belts along the streams range from 80 rods to three-fourths of a mile in width, and contain the following varieties of trees: Oak, elm, cottonwood, box elder, hickory, walnut, ash, sycamore, hackberry, mulberry, and occasional specimens of cedar, basswood, soft maple, and honey locust.

POPULATION AND VALUATION.—MARSHALL COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	23,319	25,141	\$2,679,918	\$561,567	\$496,043	\$795,064	\$4,532,592
Balderson twp.....	713	756	\$109,455	\$10,970	.....	.....	\$120,425
Irving city.....	389 } 1,338	374 } 1,367	163,345	16,850	\$17,125	\$87,019	284,339
Blue Rapids twp.....	949 }	993 }	.....	.....	.....	.....	.....
Blue Rapids city.....	1,068 }	1,126 }	106,816	29,550	71,204	78,397	285,967
Blue Rapids City twp.	490 }	595 }	.....	.....	.....	.....	.....
Center twp.....	569	651	114,955	11,598	.....	12,991	139,544
Clear Fork twp.....	875	1,009	150,150	18,020	3,113	24,475	195,758
Cleveland twp.....	437	488	102,110	12,004	.....	.....	114,114
Cottage Hill twp.....	592	597	110,100	13,920	.....	.....	124,020
Elm Creek twp.....	551	608	99,230	8,940	484	48,482	157,136
Franklin twp.....	820	838	114,705	12,133	4,700	40,570	172,108
Beattie city.....	633 }	674 }	104,110	17,960	17,782	56,837	196,689
Gittard twp.....	601 }	663 }	.....	.....	.....	.....	.....
Herkimer twp.....	621	658	113,445	22,402	.....	.....	135,847
Logan twp.....	816	848	116,075	15,426	6,236	47,985	185,722
Marysville city.....	2,198 }	2,256 }	127,015	116,073	203,081	90,975	537,144
Marysville twp.....	608 }	610 }	.....	.....	.....	.....	.....
Axtell city.....	527 }	473 }	164,965	55,109	32,127	74,224	326,425
Murray twp.....	1,089 }	1,253 }	137,142	37,980	10,770	39,600	223,492
Vermillion city.....	.....	271 }	.....	.....	.....	.....	.....
Noble twp.....	1,071	900	.....	.....	.....	.....	.....
Oketo city.....	268 }	390 }	95,505	18,520	10,846	37,946	162,817
Oketo twp.....	712 }	745 }	.....	.....	.....	.....	.....
Richland twp.....	736	913	113,200	8,349	2,715	.....	124,264
Rock twp.....	642	674	100,445	13,367	.....	.....	113,812
Summerfield city.....	381 }	398 }	95,820	19,734	16,858	39,195	171,607
St. Bridget twp.....	479 }	632 }	.....	.....	.....	.....	.....
Frankfort city.....	1,063 }	1,117 }	125,900	47,968	63,907	66,604	304,379
Vermillion twp.....	818 }	920 }	.....	.....	.....	.....	.....
Walnut twp.....	591 }	608 }	110,320	13,226	.....	.....	123,546
Waterville city.....	644 }	685 }	101,460	33,695	35,095	46,450	216,700
Waterville twp.....	.....	.....	.....	.....	.....	.....	.....
Wells twp.....	704	704	103,650	7,773	.....	3,314	114,737

Magnesian limestone is abundant in all sections of the county, and is quarried at or near the towns of Oketo, Beattie, Bigelow, and Irving. The best buildings in all of the cities are built of this material, and it is shipped to Omaha, St. Joseph and Kansas City markets. A superior quality of stone, suitable for curbing, is found in the same locality. Small quantities of mineral paint and cement rock are met with in some localities. Beds of clay, though of an inferior quality, are generally distributed throughout the county, from which brick is manufactured largely near Frankfort and Marysville. Gypsum crops out along the Big Blue river, and at the city of Blue Rapids it is extensively manufactured into a valuable quality of plas-

FARM AND CROP STATISTICS.—MARSHALL COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	23,030	73,468	\$35,264 64	31,031	497,440	\$198,976 00
Spring wheat.....bu.	161	1,937	832 91	171	2,565	974 70
Corn.....bu.	177,627	4,263,048	1,065,762 00	185,678	2,042,458	694,435 72
Oats.....bu.	35,724	785,928	172,904 16	36,591	759,250	204,997 50
Rye.....bu.	454	6,356	2,542 40	1,697	35,637	14,254 80
Barley.....bu.	2	36	14 40	115	1,380	579 60
Buckwheat.....bu.	150	900	675 00	36	288	172 80
Irish potatoes.....bu.	1,330	46,550	45,153 50	1,619	69,617	55,693 60
Sweet potatoes.....bu.	5	440	440 00	10	590	531 00
Castor beans.....bu.				2	16	16 00
Sorghum.....bu.	338		7,208 00	687		13,231 00
Flax.....bu.	189	1,323	1,124 55	62	744	744 00
Tobacco.....lbs.	1					
Broom corn.....lbs.	395	197,500	5,925 00	220	88,000	3,520 00
Millet and hungarian, tons	11,815	26,583	106,332 00	15,338	23,007	69,021 00
Milo maize.....tons						
Kafir corn.....tons	1	‡	11 00	44	880	440 00
Jerusalem corn.....tons				5	‡	37 50
Timothy.....tons	11,810	* 18,394	110,364 00	7,511	† 14,930	89,580 00
Clover.....tons	3,794			301		
Blue grass.....tons	1,133			1,530		
Alfalfa.....tons				313		
Orchard grass.....tons	109			36		
Other tame grasses.....tons	485			443		
Prairie grass, fenced.....tons	89,846	23,266	98,880 50	109,035	21,969	109,845 00
Totals.....	358,399		\$1,653,434 06	392,535		\$1,457,050 22

Wheat on hand March 1, 1893, 67,422 bushels; March 1, 1894, 62,834 bushels.

Corn on hand March 1, 1893, 1,062,660 bushels; March 1, 1894, 1,113,978 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—MARSHALL COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	358,399	\$1,653,434 06	392,535	\$1,457,050 22
Animals slaughtered and sold for slaughter.....		793,440 00		1,036,675 00
Milk sold.....		96 00		572 00
Poultry and eggs sold.....		11,912 00		83,202 00
Wool clip.....lbs.	650	104 00	3,854	501 02
Cheese.....lbs.			3,560	427 20
Butter.....lbs.	407,108	65,137 28	615,665	98,506 40
Garden products marketed.....		2,839 00		2,218 00
Horticultural products.....		1,379 00		971 00
Honey and beeswax.....lbs.	3,570	643 23	13,459	2,423 20
Wine manufactured.....gals.	229	229 00	1,331	1,331 00
Wood marketed.....		3,937 00		4,416 00
Totals.....		\$2,533,150 57		\$2,688,293 04

ter of Paris. Salt water appears in several localities while boring wells. Veins of coal are found at a considerable depth. Springs are numerous, and good well water is reached at an average depth of 25 feet. The county is well supplied with streams, of which the Big Blue river is the principal.

LIVE STOCK.—MARSHALL COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	17,315	\$900,380 00	16,441	\$542,553 00
Mules and asses.....	2,650	164,300 00	1,508	63,336 00
Milch cows.....	15,816	306,320 00	10,968	241,296 00
Other cattle	31,890	542,130 00	25,990	467,820 00
Sheep	631	1,577 50	620	1,550 00
Swine	40,619	304,642 50	41,715	292,005 00
Totals.....	108,421	\$2,219,350 00	97,242	\$1,608,560 00

Number of dogs in county March 1, 1893, 2,929; March 1, 1894, 3,191.

Number of sheep killed by dogs, year ending March 1, 1894, 11.

McPHERSON COUNTY.

Was organized in 1870; has an area of 900 square miles. Its population consists largely of the German element, in the southern portion, Swedish in the northern, and American in the central. It ranks as the 19th county in population in the state.

POPULATION AND VALUATION.—McPHERSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.					
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.	
The county.....	21,533	21,359	\$2,527,078	\$710,647	\$611,386	\$671,191	\$4,520,302	
Battle Hill twp.....	395	403	\$60,690	\$9,804	.....	.....	\$70,494
Bonaville twp.....	291	291	46,500	7,847	.....	.....	54,347
Canton city.....	406 } 1,020	385 } 1,015	100,770	44,297	\$36,975	\$73,349	255,391	
Canton twp.....	614 }	630 }	.....	.....	.....	.....	.....
Windom city.....	197 }	581	91,710	16,576	16,769	30,052	155,107
Castle twp.....	553	384 }
Delmore twp.....	447	435	67,901	9,490	.....	.....	77,391
Galva city.....	283 } 941	218 }	874	123,300	26,964	13,560	67,072	230,896
Empire twp.....	658 }	656 }
Groveland twp.....	616	597	113,567	25,354	769	31,251	170,941	
Gypsum Creek twp..	511	509	82,016	21,812	965	.....	104,793
Harper twp.....	462	429	82,810	14,590	.....	.....	97,400
Hayes twp.....	650	623	113,307	22,380	.....	.....	135,687
Jackson twp.....	569	596	119,855	24,873	5,985	29,970	180,683	
King City twp.....	490	485	114,535	14,617	2,760	48,354	180,266	
Little Valley twp....	445	629	93,460	12,278	.....	6,582	112,320
Lone Tree twp.....	938	1,035	111,013	6,947	.....	976	118,936
Marquette city.....	381 } 934	432 }	84,960	48,610	41,603	52,209	227,382	
Marquette twp.....	553 }	548 }	.....	.....	.....	.....	.....
McPherson city.....	3,365 } 3,980	3,025 }	137,914	142,312	340,558	109,379	730,163	
McPherson twp.....	615 }	567 }	.....	.....	.....	.....	.....
Meridian twp.....	778	718	115,364	18,820	.....	843	135,027
Moundridge city....	541 } 1,341	442 }	122,680	38,437	29,417	38,851	229,385	
Mound twp.....	800 }	788 }	.....	.....	.....	.....	.....
New Gotland twp....	662	664	102,030	15,477	.....	30,709	148,216
Lindsborg city.....	1,312 } 2,062	1,404 }	125,802	75,464	104,186	64,818	370,270	
Smoky Hill twp.....	750 }	746 }	.....	.....	.....	.....	.....
S. Sharp's Creek twp.	314	440	63,060	9,960	.....	.....	73,020
Spring Valley twp...	720	707	117,616	26,661	.....	.....	144,277
Inman city.....	.....	274 }	110,325	37,300	17,839	38,325	203,789
Superior twp.....	1,075	804 }	.....	.....	.....	.....	.....
Turkey Creek twp....	754	726	119,500	11,777	.....	.....	131,277
Union twp.....	585	572	106,393	28,000	.....	48,451	182,844

The city of McPherson, situated near the center of the county, is the county seat, and a city of the second class. Lindsborg, in the northern portion, Galva and Canton in the eastern, Moundridge in the southeastern, Inman in the southwest, Windom in the western, and Marquette, in the northwestern portion, are all places of consequence. There are several smaller towns in the county.

The railroads in the county are: The Salina & Southwestern, Kansas & Colorado, Council Grove, Smoky Valley & Western, and the Fort Scott, Wichita & Western, operated by the Missouri Pacific; the Marion & McPherson, of the Atchison, Topeka & Santa Fé system; and the Chicago, Kansas & Nebraska, of the Chicago, Rock Island & Pacific.

The general surface is a gently rolling prairie, somewhat broken toward the north, and nearly level in the center. Bottom lands average from one-half to one mile in width, and cover 7 per cent. of the entire area. Timber is not very plentiful; the belts on the streams average about 20 rods in width, and contain the following varieties of trees: Cottonwood, box elder, ash, oak, mulberry, hackberry, coffee bean, and willow. The county is but moderately supplied with streams, and well water is obtained at an average depth of 25 feet. The Smoky Hill river enters the county at the northwestern corner, flows southeast for a distance of about 10 miles, then turns to the northeast, crossing the northern boundary about its center.

Quarries of limestone are worked in the northeastern portion of the county. Sandstone is found in the northeastern and northwestern portions. Beds of gypsum exist on the head waters of Gypsum creek, in the northeastern part of the county.

FARM AND CROP STATISTICS.—McPHERSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	150,170	1,231,390	\$554,125 50	145,381	1,046,736	\$418,694 40
Spring wheat.....bu.	5					
Corn.....bu.	89,649	1,344,735	403,420 50	89,095	712,760	249,466 00
Oats.....bu.	39,537	632,592	164,473 92	33,824	236,768	63,927 36
Rye.....bu.	2,882	23,056	7,377 92	2,697	24,273	9,709 20
Barley.....bu.	394	3,940	1,576 00	456	1,824	729 60
Buckwheat.....bu.	10	60	45 00	22	176	105 60
Irish potatoes.....bu.	1,309	65,450	52,360 00	1,351	40,530	30,397 50
Sweet potatoes.....bu.	21	2,100	2,100 00	25	2,500	2,500 00
Castor beans.....bu.						
Sorghum.....bu.	1,397		27,930 00	3,760		21,620 00
Flax.....bu.	162	810	688 50	166	1,162	1,162 00
Tobacco.....lbs.						
Broom corn.....lbs.	7,122	4,743,252	118,581 30	5,271	3,162,600	126,504 00
Millet and hungarian, tons	1,761	3,522	17,610 00	2,414	3,621	18,105 00
Milo maize.....tons	14	† 42	147 00	42	840	378 00
Kaffir corn.....tons	44	† 176	616 00	519	7,785	3,892 50
Jerusalem corn.....tons				12	† 180	90 00
Timothy.....tons	1,355			1,955		
Clover.....tons	589			57		
Blue grass.....tons	165			596		
Alfalfa.....tons	2,057	* 4,172	25,032 00	1,812	† 3,712	22,272 00
Orchard grass.....tons	44			17		
Other tame grasses.....tons	211			101		
Prairie grass, fenced.....tons	89,818	28,287	113,148 00	94,958	19,997	79,988 00
Totals.....	388,716		\$1,489,231 64	384,531		\$1,049,541 16

Wheat on hand March 1, 1893, 732,865 bushels; March 1, 1894, 360,120 bushels.

Corn on hand March 1, 1893, 713,113 bushels; March 1, 1894, 149,168 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—McPHERSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	388,716	\$1,489,231 64	384,531	\$1,049,541 16
Animals slaughtered and sold for slaughter.....		679,244 00		651,008 00
Milk sold.....		3,145 00		6,417 00
Poultry and eggs sold.....		106,190 00		68,201 00
Wool clip.....lbs.	1,822	291 52	4,702	611 26
Cheese.....lbs.	2,577	283 47	2,511	301 32
Butter.....lbs.	433,133	69,301 28	431,232	68,997 12
Garden products marketed.....		5,566 00		3,135 00
Horticultural products.....		2,494 00		2,414 00
Honey and beeswax.....lbs.	560	100 94	296	53 28
Wine manufactured.....gals.	10,059	10,059 00	8,323	8,323 00
Wood marketed.....		728 00		737 00
Totals.....		\$2,366,634 85		\$1,859,739 14

LIVE STOCK.—McPHERSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,382	\$539,864 00	16,435	\$542,355 00
Mules and asses.....	628	38,936 00	967	40,614 00
Milch cows.....	9,706	194,120 00	9,226	202,972 00
Other cattle.....	22,687	385,679 00	19,075	343,350 00
Sheep.....	503	1,257 50	629	1,572 50
Swine.....	25,856	193,920 00	24,748	173,236 00
Totals.....	69,762	\$1,353,776 50	71,080	\$1,304,099 50

Number of dogs in county March 1, 1893, 2,568; March 1, 1894, 2,756.

Number of sheep killed by dogs, year ending March 1, 1894, 3.

Number of sheep killed by wolves, year ending March 1, 1894, 16.

MEADE COUNTY.

It has an area of 975 square miles, and ranks as the 90th county in point of population. Meade Center, lying near the center, is the county seat.

The Chicago, Rock Island & Pacific railroad crosses the northern portion of the county.

The general surface is a rolling prairie, some bluffs and rough lands occurring in the southeastern portion. The valleys average one mile in width, and cover about 10 per cent. of the total area. Timber is very scarce, a few groves being on some of the larger streams; cottonwood and elm are the principal varieties.

Sandstone and limestone, not of the best quality, are found in the northern and southern portions. A short distance from Meade Center, there is, upon a high prairie, a depression of the surface about 200 feet in diameter filled with very strong salt water, and it is thought there is beneath it a large deposit of salt. In the north-eastern portion is an area of several miles square in which are numerous artesian

wells, having a strong flow of pure water, utilized with great success for irrigation, on a large scale. Mineral paint has been discovered in the southeastern portion of the county. Gypsum underlies the whole surface, varying in depths, cropping out in the rougher portions.

POPULATION AND VALUATION.—MEADE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,048	2,025	\$734,895	\$37,274	\$75,973	\$172,668	\$1,020,810
Cimarron twp.....	89	76	\$63,580	\$2,340	\$1,008	.....	\$66,928
Crooked Creek twp.....	182	183	51,483	1,921	.....	.....	53,404
Eden twp.....	89	92	60,360	613	773	\$32,497	94,243
Fowler twp.....	367	378	92,360	5,818	6,350	54,270	158,798
Logan twp.....	160	167	81,030	1,970	.....	.....	83,000
Meade city.....	320 } 540	315 } 504	117,630	12,286	58,653	39,032	227,601
Meade Center twp....	220 }	189 }	63,850	1,143	.....	.....	64,993
Mertilla twp.....	70	67	37,830	4,086	.....	.....	41,916
Odee twp.....	144	157	54,550	3,623	240	.....	58,413
Sand Creek twp.....	176	183	.....	.....	.....	.....	.....
West Plains city.....	57 }	32 }	112,222	3,474	8,949	46,869	171,514
West Plains twp.....	174 }	186 }	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—MEADE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	15,299	16,518	\$6,607 20	20,492	64,547	\$23,862 39
Spring wheat.....bu.	250	.....	.....	17	.....	.....
Corn.....bu.	4,556	.....	.....	1,655	.....	.....
Oats.....bu.	934	7,472	2,988 80	310	1,807	542 10
Rye.....bu.	2,379	11,895	4,520 10	1,811	14,488	5,795 20
Barley.....bu.	4,940	49,400	19,760 00	2,951	35,412	13,466 56
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	51	1,020	1,020 00	48	1,920	1,920 00
Sweet potatoes.....bu.	16	800	800 00	6	522	522 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	2,368	.....	18,700 00	2,745	.....	16,739 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	829	207,250	5,181 25	150	45,000	1,350 00
Millet and hungarian..tons	816	816	3,264 00	444	222	1,110 00
Milo maize.....tons	465	† 1,395	4,882 00	215	2,150	967 50
Kaffir corn.....tons	1,210	† 2,420	8,470 00	2,507	25,070	12,535 00
Jerusalem corn.....tons	60	† 90	270 00	15	150	75 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	* 1,494	8,964 00	958	† 1,478	8,868 00
Alfalfa.....tons	896	.....	.....	.....	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	5	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	12,552	3,932	13,762 00	8,070	4,448	13,344 00
Totals.....	47,626	.....	\$99,189 35	42,394	.....	\$100,606 75

Wheat on hand March 1, 1893, 7,336 bushels; March 1, 1894, 3,035 bushels.

Corn on hand March 1, 1893, 619 bushels; March 1, 1894, 10 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—MEADE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	47,626	\$99,189 35	42,394	\$100,606 75
Animals slaughtered and sold for slaughter.....		39,920 00		37,231 00
Milk sold.....				125 00
Poultry and eggs sold.....		2,552 00		2,537 00
Wool clip.....lbs.	13,297	2,127 52	13,065	1,698 45
Cheese.....lbs.	3,080	338 80	2,815	337 80
Butter.....lbs.	40,414	6,466 24	42,809	6,849 44
Garden products marketed.....		1,783 00		1,046 00
Horticultural products.....		35 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	48	48 00	11	11 00
Wood marketed.....		9 00		
Totals.....		\$152,468 91		\$150,442 44

LIVE STOCK.—MEADE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,106	\$109,512 00*	2,339	\$77,187 00
Mules and asses.....	215	13,330 00	167	7,014 00
Milch cows.....	1,202	24,040 00	1,154	25,388 00
Other cattle.....	10,653	181,101 00	6,305	113,490 00
Sheep.....	2,184	5,460 00	3,152	7,880 00
Swine.....	862	6,465 00	765	5,355 00
Totals.....	17,222	\$339,908 00	13,882	\$236,314 00

Number of dogs in county March 1, 1893, 370; March 1, 1894, 335.

MIAMI COUNTY.

It was organized under the name of Lykins, in 1855, but after the state was admitted into the union, in 1861, its present name was given. It has an area of 588 square miles, and ranks 25th in population. Paola, lying a little west of the center, is the county seat. Louisburg, in the northeastern portion, and Osawatomie and Fontana, in the southwestern and south-central portions, are prominent places. One of the state asylums for the care of the insane is located at Osawatomie.

In the county are portions of the Atchison, Topeka & Santa Fé and the Missouri Pacific railroads; the Kansas City, Fort Scott & Memphis railroad; also, the Kansas City & Pacific, a member of the Missouri, Kansas & Texas system.

The general surface is an undulating prairie, with a few bluffs and rough lands on the streams. The valleys of the rivers and creeks average one mile in width, and aggregate 20 per cent. of the county area. The county is plentifully supplied with timber, the belts along the streams averaging from one-fourth to a mile in width, and groves of artificial forests appear upon many of the upland farms. The varieties of native timber found are: Walnut, oak, hickory, hackberry, ash, elm, soft maple, cottonwood, coffee bean, and box elder.

Limestone and sandstone, excellent for building purposes, are found in nearly

every portion. A fine quality of marble is quarried at Fontana, and the product shipped to all portions of the state; it is held in much esteem by builders. A coralline marble is found on Pottawatomie creek, near Osawatomie. A colored marble, making an excellent building material, is found three miles west, and is largely utilized. The county abounds in good building stone, much used in the construc-

POPULATION AND VALUATION.—MIAMI COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	18,666	18,924	\$2,434,986	\$899,719	\$628,600	\$785,449	\$4,748,754
Marysville twp.	1,520	1,500	\$246,215	\$37,310	\$6,640	\$155,208	\$445,373
Miami twp.	826	785	149,320	45,700	1,920	.....	196,940
Middle Creek twp. ...	1,229	1,263	217,277	60,224	3,893	23,245	304,639
Mound twp.	710	704	118,230	24,538	2,305	27,675	172,748
Osage twp.	1,046	1,074	152,080	48,945	12,595	87,141	300,761
Osawatomie city.	2,739	2,678	156,820	88,560	193,904	130,853	570,137
Osawatomie twp.	853 } 3,592	963 } 3,641					
Paola city.	3,058	3,031	184,280	213,136	355,346	158,989	911,751
Paola twp.	643 } 3,701	640 } 3,671					
Richland twp.	1,284	1,355	287,875	71,284	.....	16,276	375,435
Stanton twp.	794	918	163,033	44,962	534	.....	208,529
Sugar Creek twp.	723	760	149,471	45,297	.....	.....	194,768
Ten Mile twp.	872	857	225,670	65,025	2,993	68,766	362,454
Louisburg city.	628 } 1,458	645 } 1,435	226,575	100,983	48,470	33,814	409,842
Wea twp.	830	790	.....	.....	.....	.....	.....
Valley twp.	911	961	158,140	53,755	.....	83,482	295,377

FARM AND CROP STATISTICS.—MIAMI COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat	14,373	189,140	\$109,701 20	11,936	177,600	\$78,144 00
Spring wheat	206	.....	.....	21	.....	.....
Corn	98,904	2,472,600	791,232 00	103,243	2,477,832	941,576 16
Oats	22,261	445,220	97,948 40	24,205	562,032	157,368 96
Rye	293	.....	.....	397	6,749	2,969 56
Barley	105	.....	.....	58	580	232 00
Buckwheat	13	65	48 75	.....	.....	.....
Irish potatoes	955	61,120	39,728 00	4,363	349,040	183,481 60
Sweet potatoes	37	2,146	2,146 00	23	2,645	1,322 50
Castor beans	52	260	299 00	17	136	136 00
Sorghum	225	.....	2,929 00	395	.....	13,035 00
Flax	4,176	37,584	31,946 40	4,110	36,990	36,990 00
Tobacco	44	.....	.....	37	48,100	4,810 00
Broom corn .....	.....	.....	.....	18	.....	.....
Millet and hungarian. lbs.	1,965	3,930	15,720 00	2,153	4,306	21,550 00
Milo maize .....	.....	.....	.....	13	260	117 00
Kaffir corn .....	.....	.....	.....	3	75	37 50
Jerusalem corn .....	.....	.....	.....	.....	.....	.....
Timothy	42,892	* 21,290	127,740 00	44,774	† 23,188	139,128 00
Clover	5,383			3,387		
Blue grass	3,351			4,283		
Alfalfa	21			15		
Orchard grass	30	7,250	25,375 00	194	8,986	44,930 00
Other tame grasses	2,882			2,832		
Prairie grass, fenced. tons	16,785	.....	.....	19,522	.....	.....
Totals	214,953	.....	\$1,244,813 75	225,999	.....	\$1,630,808 28

Wheat on hand March 1, 1893, 24,455 bushels; March 1, 1894, 97,782 bushels.

Corn on hand March 1, 1893, 703,360 bushels; March 1, 1894, 1,034,706 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

tion of fences, buildings, and bridges. Small veins of coal, from 12 to 18 inches in thickness, exist in several places, and are mined for home consumption. Two miles southwest of Louisburg a fair quality of fire clay exists, and is manufactured. Pottery clay has been found in several localities, and utilized to a small extent. Salt water is found in nearly all of the deep wells. Natural gas has been discovered in several portions of the county. It is used at Paola and Osawatomie for heating and lighting purposes.

Springs are numerous, and well water is easily obtained at from 12 to 30 feet in depth. The principal stream is the Marais des Cygnes river. Coal in considerable quantities is said to underlie the county at a depth of 200 feet.

The Missouri Pacific railroad has extensive machine shops located at Osawatomie.

SUMMARY.—MIAMI COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	214,953	\$1,244,813 75	225,999	\$1,630,808 28
Animals slaughtered and sold for slaughter.....		716,150 00		837,977 00
Milk sold.....		1,075 00		7,171 00
Poultry and eggs sold.....		43,140 00		86,552 00
Wool clip.....lbs.	5,320	851 20	4,352	565 76
Cheese.....lbs.	3,500	385 00	1,550	186 00
Butter.....lbs.	407,245	65,159 20	411,375	65,820 00
Garden products marketed.....		7,025 00		12,387 00
Horticultural products.....		4,000 00		972 00
Honey and beeswax.....lbs.	10,482	1,923 86	5,642	1,019 56
Wine manufactured.....gals.	510	510 00	419	419 00
Wood marketed.....		1,325 00		3,339 00
Totals.....		\$2,086,358 01		\$2,647,216 60

LIVE STOCK.—MIAMI COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	12,526	\$651,352 00	11,832	\$390,456 00
Mules and asses.....	1,069	66,278 00	1,216	51,072 00
Milch cows.....	6,907	138,140 00	6,745	148,390 00
Other cattle.....	20,504	348,568 00	19,120	344,160 00
Sheep.....	2,383	5,957 50	2,830	7,075 00
Swine.....	22,272	167,040 00	32,225	225,575 00
Totals.....	65,661	\$1,377,335 50	73,968	\$1,166,728 00

Number of dogs in county March 1, 1893, 1,956; March 1, 1894, 1,800.

MITCHELL COUNTY.

Was organized in 1870; has 720 square miles of territory, and ranks as the 43d county in the state in point of population. Beloit, on the Solomon river, north and east of the center, is the county seat. Cawker City, situated in the northwestern corner of the county, is a thriving place. Glen Elder, Asherville, Simpson and Scottsville are railroad towns at which considerable business is transacted.

The railroads in the county are: The Solomon branch of the Union Pacific; the Atchison, Colorado & Pacific, operated by the Missouri Pacific system.

POPULATION AND VALUATION.—MITCHELL COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	13,913	13,936	\$2,091,216	\$371,703	\$530,347	\$292,070	\$3,286,708
Asherville twp.....	679	707	\$142,770	\$20,880	.....	\$33,544	\$197,194
Beloit city.....	2,262	2,186	226,360	126,528	\$369,175	78,066	800,012
Beloit twp.....	1,022	1,133	.....	.....	.....	.....	.....
Bloomfield twp.....	560	491	89,480	6,270	.....	.....	95,750
Blue Hill twp.....	423	406	70,340	4,920	.....	.....	75,260
Carr Creek twp.....	407	407	96,610	4,515	.....	.....	101,125
Cawker City.....	714	888	144,830	50,065	107,920	40,715	343,530
Cawker twp.....	594	607	.....	.....	.....	.....	.....
Center twp.....	414	434	89,600	9,815	.....	.....	99,415
Custer twp.....	374	404	60,935	6,755	.....	.....	67,690
Eureka twp.....	362	339	75,815	3,075	.....	.....	78,890
Glen Elder city.....	357	310	134,355	43,905	36,040	39,608	253,908
Glen Elder twp.....	671	646	.....	.....	.....	.....	.....
Hayes twp.....	452	581	83,660	6,920	.....	.....	90,580
Logan twp.....	632	575	84,577	9,135	3,697	8,065	105,474
Lulu twp.....	722	624	112,674	13,670	6,660	51,870	184,874
Pittsburg twp.....	524	529	69,795	10,465	6,855	.....	87,115
Plum Creek twp.....	492	481	121,730	12,420	.....	1,489	135,639
Round Springs twp.....	224	225	70,990	3,950	.....	.....	76,429
Salt Creek twp.....	300	286	72,470	5,905	.....	.....	78,375
Solomon Rapids twp.....	555	521	116,335	11,180	.....	12,471	139,986
Turkey Creek twp.....	576	568	116,770	11,450	.....	26,242	154,462
Walnut Creek twp.....	597	588	111,120	9,880	.....	.....	121,000

FARM AND CROP STATISTICS.—MITCHELL COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	96,011	351,396	\$154,614 24	92,781	500,087	\$205,036 67
Spring wheat.....bu.	1,064	.....	.....	9	.....	.....
Corn.....bu.	65,352	784,224	203,898 24	73,739	442,434	176,973 60
Oats.....bu.	19,277	289,155	69,397 20	12,886	104,034	31,210 20
Rye.....bu.	3,347	20,082	6,627 06	1,350	8,100	3,078 00
Barley.....bu.	68	.....	.....	.....	.....	.....
Buckwheat.....bu.	3	15	11 25	12	.....	57 60
Irish potatoes.....bu.	980	36,260	31,183 60	786	9,432	8,771 76
Sweet potatoes.....bu.	4	132	132 00	6	90	72 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	769	.....	9,792 00	1,256	.....	17,467 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	44	22,000	660 00	30	.....	.....
Millet and hungarian, tons	1,902	2,853	11,412 00	2,376	2,970	11,880 00
Milo maize.....tons	10	30	105 00	10	100	45 00
Kaffir corn.....tons	180	540	1,890 00	1,139	11,390	5,695 00
Jerusalem corn.....tons	11	22	66 00	240	2,400	1,200 00
Timothy.....tons	494	.....	.....	146	.....	.....
Clover.....tons	57	.....	.....	4	.....	.....
Blue grass.....tons	35	.....	.....	185	.....	.....
Alfalfa.....tons	3,502	4,017	24,102 00	4,408	4,270	25,620 00
Orchard grass.....tons	.....	.....	.....	6	.....	.....
Other tame grasses.....tons	18	.....	.....	50	.....	.....
Prairie grass, fenced.....tons	70,881	9,060	27,180 00	59,458	10,557	42,228 00
Totals.....	264,009	.....	\$541,070 59	250,377	.....	\$529,333 83

Wheat on hand March 1, 1893, 268,397 bushels; March 1, 1894, 128,341 bushels.

Corn on hand March 1, 1893, 495,896 bushels; March 1, 1894, 251,144 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

Of the general surface, 70 per cent. is undulating, 20 per cent. bottom land, and 10 per cent. bluffs and stony, unfit for cultivation. The bottoms of the Solomon are very wide, in some places extending to a distance of three miles, while those on the creeks are from one-fourth to one-half mile in width. Timber belts average one-fourth of a mile in width, and contain the following varieties of trees: Cottonwood, oak, ash, walnut, hackberry, red and white elm, and box elder. But few springs exist, although there are several very large ones, and well water is easily reached at an average depth of 16 feet. The North and South Forks of the Solomon enter the county on the western border, and, flowing southeast and northeast for a distance of about three miles, form a junction and make the Solomon river.

Magnesian limestone and sandstone abound in all portions of the county, principally in the bluffs on the banks of the streams. The limestone is much used in buildings and fences, and is found in layers averaging a thickness of eight inches; it is very soft when first quarried, but hardens rapidly from exposure. The sandstone is an excellent building material, and is much used. Potters' clay exists near Cawker City and Beloit, and through the central portion of the county. Gypsum is found in small quantities in several localities. Salt springs and marshes are abundant on Salt creek, in the southern portion, while a few are found on Carr and Hard Scrabble creeks. The "Great Spirit" spring, two and one-half miles southeast of Cawker City, is heavily impregnated with salt. Coal is found in several localities.

SUMMARY.—MITCHELL COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	264,009	\$541,070 59	250,377	\$529,333 83
Animals slaughtered and sold for slaughter.....		446,367 00		496,657 00
Milk sold.....		2,170 00		226 00
Poultry and eggs sold.....		83,493 00		83,584 00
Wool clip.....lbs.	23,591	3,774 56	11,342	1,474 46
Cheese.....lbs.	42	4 62	530	63 60
Butter.....lbs.	425 017	68,002 72	422,801	67,648 16
Garden products marketed.....		5,990 00		4,486 00
Horticultural products.....		3,869 00		885 00
Honey and beeswax.....lbs.	5,509	992 04	4,008	721 74
Wine manufactured.....gals.	662	662 00	13	13 00
Wood marketed.....		751 00		1,002 00
Totals.....		\$1,157,146 53		\$1,186,094 79

LIVE STOCK.—MITCHELL COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,853	\$616,356 00	12,222	\$403,326 00
Mules and asses.....	774	47,988 00	847	35,574 00
Milch cows.....	7,996	159,920 00	6,702	147,444 00
Other cattle.....	19,133	325,261 00	16,331	293,958 00
Sheep.....	5,052	12,630 00	2,232	5,580 00
Swine.....	20,810	156,075 00	21,924	153,468 00
Totals.....	65,618	\$1,318,230 00	60,258	\$1,039,350 00

Number of dogs in county March 1, 1893, 1,754; March 1, 1894, 1,909.

Number of sheep killed by wolves, year ending March 1, 1894, 20.

MONTGOMERY COUNTY.

Organized in 1869, has an area of 648 square miles, and ranks as the 14th county in the state in number of inhabitants. Independence, situated on the Verdigris river, north and east of the center, is the county seat. Cherry Vale, situated in the northeastern portion, is a place of much importance to southeastern Kansas; several railroads converge at this point. Coffeyville, in the southeastern portion, has a large trade in the Indian Territory, being one of the most important towns on the southern border. Elk City, in the northwestern section, does a considerable trade locally.

The county is well equipped with railroad facilities. Branches of the Atchison, Topeka & Santa Fé and Missouri Pacific systems, the Missouri Pacific, and the St. Louis & San Francisco, extend in all directions in the county.

The surface is gently undulating prairie, interspersed occasionally with mounds and high lands. Bottoms comprise 25 per cent. of the total area, and average 1½ miles in width. The county is abundantly supplied with timber, the belts on the streams ranging from a few rods to one mile in width, and contain the following varieties of trees: Walnut, hickory, oak, pecan, hackberry, ash, mulberry, cottonwood, sycamore, red and white elm, maple, box elder, and locust. Well water is reached at a depth of 25 feet. The Verdigris river enters the county on the northern border, and flows east of south through the eastern portion, crossing the southern boundary four miles west of the southeastern corner.

Coal from one to two feet thick is mined in the central portion. Sandstone is found in great abundance northwest, south and east of Independence. An excellent quality of limestone is also found near Independence. A great quantity of good building stone exists in the bluffs along the streams. Potters' clay is found in Fawn Creek township, just above the coal veins, and also exists north of Independence. At Coffeyville there are brickyards that make superior pressed brick.

POPULATION AND VALUATION.—MONTGOMERY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	22,379	24,452	\$1,671,557	\$414,926	\$756,721	\$942,967	\$3,786,163
Caney city.....		1,008					
Caney twp.....	2,180	1,385	2,393	\$141,718	\$30,730	\$26,140	\$76,260
Cherokee twp.....	696		734	116,755	12,619	1,560	47,920
Cherry Vale city.....	2,120	2,243		106,425	46,966	132,578	191,101
Cherry twp.....	725	809	3,052	110,095	14,879		47,693
Drum Creek twp.....		726	742	150,280	14,736	431	69,942
Fawn Creek twp.....	1,287		1,250				235,381
Independence city.....	3,450	3,589					
Independence twp.....	1,444	1,491	5,080	235,598	118,087	320,385	134,526
Liberty city.....		314					
Liberty twp.....	1,139	1,062	1,376	121,860	86,348	14,201	30,245
Elk city.....	679	705					
Louisburg twp.....	1,276	1,290	1,995	194,825	34,440	47,425	109,302
Coffeyville city.....	2,604	3,925	4,626	112,978	6,404	213,463	110,571
Parker twp.....	767	701					443,416
Rutland twp.....	1,236	1,096	131,735	18,772			13,816
Sycamore twp.....	1,378	1,385	158,949	17,701	538		71,181
West Cherry twp.....	672	723	90,339	13,244			40,410
							143,993

FARM AND CROP STATISTICS.—MONTGOMERY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	51,216	632,515	\$265,656 30	45,948	1,025,087	\$399,783 93
Spring wheat.....bu.	9			52		
Corn.....bu.	53,939	916,963	275,088 90	59,417	950,672	351,748 64
Oats.....bu.	21,237	573,399	181,881 77	21,158	423,150	118,482 00
Rye.....bu.	355	4,615	2,307 50	819	10,647	4,045 86
Barley.....bu.	30	720	288 00	30	300	120 00
Buckwheat.....bu.	11	66	49 50	4	32	19 20
Irish potatoes.....bu.	407	30,118	24,094 40	524	32,488	19,492 80
Sweet potatoes.....bu.	62	6,200	6,200 00	53	2,915	2,040 50
Castor beans.....bu.	168	840	966 00	231	1,386	1,386 00
Sorghum.....bu.	643		10,388 00	603		4,485 00
Cotton.....lbs.	83	16,600	1,162 00	21	4,200	252 00
Flax.....bu.	5,292	31,752	26,989 20	10,139	70,973	70,973 00
Tobacco.....lbs.	1					
Broom corn.....lbs.	347	242,900	7,287 00	276	138,000	4,485 00
Millet and hungarian, tons	2,230	5,017	20,068 00	1,905	3,333	13,332 00
Milo maize.....tons	23	†	322 00	41	820	369 00
Kaffir corn.....tons	36	†	630 00	64	1,280	640 00
Jerusalem corn.....tons				6	†	60 00
Timothy.....tons	4,410			5,123		
Clover.....tons	955			1,271		
Blue grass.....tons	839	* 4,599	27,594 00	833	† 4,699	28,194 00
Alfalfa.....tons	39			28		
Orchard grass.....tons	285			263		
Other tame grasses.....tons	1,173			575		
Prairie grass, fenced..tons	29,902	17,702	61,957 00	29,860	15,077	60,308 00
Totals.....	173,692		\$862,929 57	179,244		\$1,080,216 93

Wheat on hand March 1, 1893, 29,688 bushels; March 1, 1894, 69,008 bushels.

Corn on hand March 1, 1893, 157,335 bushels; March 1, 1894, 203,150 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—MONTGOMERY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	173,692	\$862,929 57	179,244	\$1,080,216 93
Animals slaughtered and sold for slaughter.....		288,080 00		314,913 00
Milk sold.....		847 00		3,675 00
Poultry and eggs sold.....		39,740 00		52,756 00
Wool clip.....lbs.	2,155	344 80	5,254	683 02
Cheese.....lbs.	20	2 20		
Butter.....lbs.	311,391	49,822 56	327,631	52,420 96
Garden products marketed.....		7,107 00		8,989 00
Horticultural products.....		4,461 00		5,525 00
Honey and beeswax.....lbs.	8,100	1,475 85	3,392	612 88
Wine manufactured.....gals.	389	389 00	759	759 00
Wood marketed.....		25 00		503 00
Totals.....		\$1,255,223 98		\$1,521,053 79

LIVE STOCK.—MONTGOMERY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,143	\$527,436 00	9,438	\$311,454 00
Mules and asses.....	1,505	93,310 00	1,638	68,796 00
Milch cows.....	7,295	145,900 00	6,544	143,968 00
Other cattle.....	12,296	209,032 00	11,387	204,966 00
Sheep.....	796	1,990 00	693	1,732 50
Swine.....	14,160	106,200 00	19,940	139,580 00
Totals.....	46,195	\$1,083,868 00	39,640	\$870,496 50

Number of dogs in county March 1, 1893, 2,702; March 1, 1894, 2,008.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 26.

MORRIS COUNTY.

Was organized in 1858; has an area of 700 square miles, and ranks as the 54th county in population. Council Grove, lying on the Neosho river, south and east of the center, is the county seat. The towns of Dunlap, in the southeastern portion, and White City and Parkerville, in the north central, and Wilsey, near the center, are of local importance.

The railroads of the county are: Missouri, Kansas & Texas; Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé; Council Grove, Osage City & Ottawa, and the Topeka, Salina & Western, operated by the Missouri Pacific; and the Chicago, Rock Island & Pacific system.

The surface of the county is generally an undulating prairie, but a small proportion being unfit for cultivation. The bottoms of the Neosho and other streams average a width of one mile, and comprise 15 per cent. of the county area. Timber belts on the streams average one-fourth of a mile in width, and contain the following varieties of trees: Walnut, hickory, oak, elm, hackberry, mulberry, coffee bean, sycamore, horse chestnut, and cottonwood. Fine groves of artificial forest trees are found on many farms. The county has numerous fine springs, Diamond and Hill springs being noted beyond their own localities for their size and volume of water. Well water is reached at an average depth of 25 feet—10 feet on the river bottoms and 30 to 40 on the uplands.

A light yellow and gray limestone underlies the entire county, cropping out about midway between the beds of the ravines and the highest levels of the prairie. Large quantities of this stone are shipped out of the county from quarries located near

POPULATION AND VALUATION.—MORRIS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	10,917	10,877	\$1,446,480	\$415,346	\$324,648	\$664,927	\$2,851,401
Clark's Creek twp...	328	328	\$111,047	\$6,859	\$398	\$49,955	\$168,259
Council Grove city...	2,366 } 2,808	2,342 } 2,789	104,813	123,545	256,809	79,368	564,535
Council Grove twp...	442 }	447 }					
Diamond Valley twp...	529	598	143,250	12,824	487	65,174	221,735
Wilsey city.....	150 }	217 }					
Elm Creek twp.....	834 }	570 }	177,303	23,707	4,538	57,534	263,082
Four Mile twp.....	325	332	64,407	16,687			81,094
Garfield twp.....	561	553	82,431	28,771	58	63,848	175,108
Grand View twp.....	542	472	134,195	26,329	1,665	76,462	238,651
Highland twp.....	439	400	71,939	12,243		37,876	122,058
Neosho twp.....	671	649	107,492	25,520	1,083	26,642	160,737
Dwight city.....		147 }					
Ohio twp.....	619	559 }	86,804	19,403	9,478	53,326	169,011
Parkerville city.....		148 }					
Parker twp.....	721 }	714 }	118,348	35,523	10,043	61,929	225,843
White City.....	322 }	497 }					
Rolling Prairie twp...	530 }	600 }	94,257	28,951	24,184	69,528	216,920
Dunlap city.....	341 }	334 }					
Valley twp.....	578 }	557 }	75,584	36,342	15,905	23,285	151,116
Warren twp.....	458	413	74,610	18,642			93,252

Council Grove and Parkerville. All of the limestones reduce easily to quicklime, and near the city of Council Grove there are extensive works manufacturing it into a superior quality of cement. A brown ocher exists in Elm Creek township, but no effort has been made toward developing it. It is generally thought that both fire and potters' clay exist in the county. Gypsum exists on some of the highest points, mixed with the clay.

FARM AND CROP STATISTICS.—MORRIS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	16,231	116,856	\$51,416 64	5,894	56,693	\$24,944 92
Spring wheat.....bu.	8			32		
Corn.....bu.	67,479	1,282,101	384,630 30	71,414	214,242	89,981 64
Oats.....bu.	22,234	333,510	73,372 20	16,644	189,740	55,024 60
Rye.....bu.	1,358	14,938	5,676 44	764	11,460	5,157 00
Barley.....bu.	29			25	200	80 00
Buckwheat.....bu.	8	96	72 00	1	8	4 80
Irish potatoes.....bu.	600	18,000	13,500 00	644	20,608	14,219 52
Sweet potatoes.....bu.	10	450	450 00	3	159	151 05
Castor beans.....bu.						
Sorghum.....bu.	596		4,906 00	1,367		10,764 40
Flax.....bu.	804	5,628	4,783 80	1,248	9,984	9,984 00
Tobacco.....lbs.						
Broom corn.....lbs.	210	99,750	2,992 50	90	18,000	540 00
Millet and hungarian, tons	6,535	13,070	39,210 00	10,867	19,015	76,060 00
Milo maize.....tons	8	†	112 00	120	2,400	1,080 00
Kaffir corn.....tons	1,218	†	12,789 00	1,256	10,048	5,024 00
Jerusalem corn.....tons	3	†	27 00			
Timothy.....tons	2,829			1,931		
Clover.....tons	543			139		
Blue grass.....tons	440	* 3,647	21,882 00	811	† 5,177	31,062 00
Alfalfa.....tons	248			322		
Orchard grass.....tons	62			71		
Other tame grasses.....tons	183			208		
Prairie grass, fenced.....tons	63,210	26,029	65,072 50	73,013	33,725	101,175 00
Totals.....	184,846		\$680,892 38	186,864		\$425,252 93

Wheat on hand March 1, 1893, 46,842 bushels; March 1, 1894, 32,166 bushels.

Corn on hand March 1, 1893, 335,404 bushels; March 1, 1894, 221,157 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—MORRIS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	184,846	\$680,892 38	186,864	\$425,252 93
Animals slaughtered and sold for slaughter.....		781,692 00		787,489 00
Milk sold.....		1,454 00		1,875 00
Poultry and eggs sold.....		33,673 00		28,845 00
Wool clip.....lbs.			9,660	1,255 80
Cheese.....lbs.				
Butter.....lbs.	277,445	44,391 20	377,434	60,389 44
Garden products marketed.....		2,644 00		2,391 00
Horticultural products.....		1,100 00		1,079 00
Honey and beeswax.....lbs.	4,504	811 42	3,261	587 10
Wine manufactured.....gals.	305	305 00	208	208 00
Wood marketed.....		1,654 00		1,042 00
Totals.....		\$1,548,617 00		\$1,310,414 27

LIVE STOCK.—MORRIS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	8,847	\$460,044 00	8,082	\$266,706 00
Mules and asses.....	435	26,970 00	505	21,210 00
Milch cows.....	4,866	97,320 00	4,782	105,204 00
Other cattle.....	26,584	451,928 00	24,790	446,220 00
Sheep.....	1,440	3,600 00	1,598	3,995 00
Swine.....	13,932	104,490 00	16,736	117,152 00
Totals.....	56,104	\$1,144,352 00	56,493	\$960,487 00

Number of dogs in county March 1, 1893, 1,381; March 1, 1894, 1,345.

MORTON COUNTY.

The extreme southwestern corner of the state. Was organized in 1886; has an area of 729 square miles, and ranks in population as the 105th county in the state. The town of Richfield, situated in the north-central portion, is the county seat. There are no railroads in the county.

The general surface is a rolling prairie, the soil being a sandy loam. Bottom lands average one mile in width, and comprise 10 per cent. of the total area. The Cimarron river and the North Fork of that stream enter the county from the west, and flow northeast across the eastern border.

FARM AND CROP STATISTICS.—MORTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	6,428			2,385	833	\$391 51
Spring wheat.....bu.	5			5		
Corn.....bu.	478	956	\$478 00	321	1,284	706 20
Oats.....bu.	1,246			308	240	84 00
Rye.....bu.	1,774			748	3,740	1,870 00
Barley.....bu.	564			14		
Buckwheat.....bu.						
Irish potatoes.....bu.	9			4	120	114 00
Sweet potatoes.....bu.				2	60	60 00
Castor beans.....bu.	42	84	96 60			
Sorghum.....bu.	1,612		8,172 00	1,900		9,633 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	3,419	940,225	18,804 50	3,692	738,400	18,460 00
Millet and hungarian, tons	40	40	200 00	81	42	210 00
Milo maize.....tons	920	† 2,300	8,050 00	620	3,100	1,395 00
Kafir corn.....tons	422	† 844	2,954 00	521	2,605	1,302 00
Jerusalem corn.....tons	772	† 772	2,316 00	721	2,884	1,442 00
Timothy.....tons						
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons						
Orchard grass.....tons						
Other tame grasses.....tons	5					
Prairie grass, fenced.....tons	3,802	480	2,160 00	1,310	424	1,696 00
Totals.....	21,538		\$43,231 10	12,632		\$37,363 71

Wheat on hand March 1, 1893, 5,808 bushels; March 1, 1894, 92 bushels.

Corn on hand March 1, 1893, 221 bushels; March 1, 1894, 155 bushels.

† Product estimated in tons for 1893; in bushels for 1894.

Magnesian limestone and sandstone exist in several localities. Inexhaustible beds of gypsum are found along the North Fork of the Cimarron river, varying from 4 to 25 feet in thickness. At the town of Richfield there are artesian wells, in depth from 600 to 700 feet filling pipes two inches in diameter with a steady flow.

POPULATION AND VALUATION.—MORTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	574	457	\$598,645	\$21,749	\$51,239	.....	\$671,633
Cimarron twp.	83	71	\$129,154	\$3,962	\$660	.....	\$133,776
Maud twp.	69	68	81,477	1,675	594	.....	83,746
Missouri twp.	70	55	89,583	929	.....	.....	90,512
Morton twp.	129	67	89,201	418	432	.....	90,051
Richfield twp.	195	156	107,682	5,714	48,691	.....	162,087
Taloga twp.	28	40	101,548	9,051	862	.....	111,461

SUMMARY.—MORTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	21,538	\$43,693 10	12,632	\$37,363 71
Animals slaughtered and sold for slaughter.....		31,170 00		19,458 00
Milk sold.....		10 00		10 00
Poultry and eggs sold.....		74,913 00		5,390 00
Wool clip.....lbs.	70	11 26		.....
Cheese.....lbs.	200	22 00	15	1 80
Butter.....lbs.	10,864	1,738 24	10,915	1,746 40
Garden products marketed.....		29 00		20 00
Horticultural products.....		.....		.....
Honey and beeswax.....lbs.		.....		.....
Wine manufactured.....gals.		.....		.....
Wood marketed.....		.....		.....
Totals.....		\$151,586 54		\$63,989 91

LIVE STOCK.—MORTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	609	\$31,668 00	1,015	\$33,495 00
Mules and asses.....	73	4,526 00	57	2,394 00
Milch cows.....	321	6,420 00	269	5,918 00
Other cattle.....	2,692	45,764 00	2,629	47,322 00
Sheep.....	6	15 00	3	7 50
Swine.....	344	2,580 00	297	2,079 00
Totals.....	4,045	\$90,973 00	4,270	\$91,215 50

Number of dogs in county March 1, 1893, 116; March 1, 1894, 100.

NEMAHA COUNTY.

It was organized in 1855, contains an area of 720 square miles, and ranks as the 26th county in population. The county seat is Seneca, lying north and west of the center. Sabetha, in the northeastern portion, and Centralia, in the southwestern, are thriving towns; Wetmore, Oneida, Corning and Goffs are growing and thrifty places. Bern, Kelly, Baileyville, Bancroft and Berwick are of importance in their respective localities.

The Kansas City, Wyandotte & Northwestern railroad; Central Branch of the Missouri Pacific; Chicago, Rock Island & Pacific; St. Joseph & Grand Island, of the Union Pacific system, all have their extensions in the county.

The surface, for the most part, is a gently rolling prairie, and adapted to successful agriculture; a small portion is broken and hilly. Bottom lands average a width of three-fourths of a mile, and comprise about 9 per cent. of the total area. Timber belts on the streams are from one-fourth to one-half a mile in width, and, among others, contain the following varieties of trees: Oak, ash, elm, hickory, hackberry, walnut, cottonwood, sycamore, and box elder. Good springs abound in all sections, and well water is obtained at an average depth of from 35 to 40 feet. The Nemaha river has its source in the south-central portion, and flows north over the northern boundary into the state of Nebraska.

A limited quantity of coal is mined in Illinois, Richmond and Washington townships and near the town of Sabetha. The veins are very thin, and not profitable for

POPULATION AND VALUATION.—NEMAHA COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.					
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.	
The county.....	18,877	18,922	\$3,168,241	\$852,808	\$394,633	\$659,229	\$5,074,921	
Adams twp.....	569	598	\$151,381	\$21,175	\$140	\$6,216	\$178,912	
Berwick twp.....	786	806	172,088	34,049	1,554	37,204	244,895	
Capioma twp.....	794	780	156,510	24,297	1,619	.....	182,426
Clear Creek twp.....	719	742	179,018	23,382	.....	.....	202,400
Oneida city.....	317 } 950	361 } 1,001	169,267	32,004	9,698	50,370	261,339	
Gilman twp.....	633 }	640 }	.....	.....	.....	.....	.....
Granada twp.....	644	694	144,446	19,436	.....	.....	163,882
Goffs city.....	291 } 929	346 } 1,032	130,654	30,825	9,988	87,812	259,279	
Harrison twp.....	638 }	686 }	.....	.....	.....	.....	.....
Centralia city.....	529 } 1,398	573 } 1,483	237,360	88,701	52,240	47,947	426,248	
Home twp.....	869 }	910 }	.....	.....	.....	.....	.....
Corning city.....	287 }	282 }	.....	.....	.....	.....	.....
Illinois twp.....	624 }	601 }	883	151,627	32,254	14,926	61,837	260,644
Marion twp.....	828	811	209,645	45,385	4,330	54,844	314,204	
Mitchell twp.....	728	683	161,936	24,722	.....	29,767	216,425
Nemaha twp.....	667	685	152,740	34,658	.....	.....	187,398
Neuchatel twp.....	694	601	146,645	22,813	.....	.....	169,458
Red Vermillion twp..	553	583	148,614	21,589	504	.....	170,707
Reilly twp.....	617	668	157,334	26,210	.....	21,422	204,966
Seneca city.....	2,062 } 2,960	1,806 } 2,747	179,583	193,214	148,619	67,567	588,983	
Richmond twp.....	898 }	941 }	.....	.....	.....	.....	.....
Sabetha city.....	1,354 } 2,029	1,354 } 2,030	185,485	91,918	99,908	73,761	451,072	
Rock Creek twp.....	675 }	676 }	.....	.....	.....	.....	.....
Washington twp.....	917	993	171,554	33,161	14,192	55,522	274,429	
Wetmore city.....	537 } 1,184	441 } 1,102	162,354	53,015	36,915	64,960	317,244	
Wetmore twp.....	647 }	661 }	.....	.....	.....	.....	.....

working. A superior quality of magnesian limestone is found in nearly every township, it being most abundant in the northwestern portion. At America City, on the south line of the county, a superior building stone is being quarried and shipped to various portions of the state. Potters' clay is found in limited quantities in the northern portion.

FARM AND CROP STATISTICS.—NEMAHA COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	19,966	38,328	\$17,247 60	13,155	248,619	\$111,878 55
Spring wheat.....bu.	48	352	140 80	74	990	386 10
Corn.....bu.	168,096	7,060,032	1,765,008 00	155,962	2,963,316	1,066,793 76
Oats.....bu.	31,835	764,040	152,808 00	25,690	307,234	82,953 18
Rye.....bu.	986	15,776	6,310 40	1,854	29,664	12,458 88
Barley.....bu.	113	2,034	711 90	77	1,386	554 40
Buckwheat.....bu.	57	513	384 75	31	248	148 80
Irish potatoes.....bu.	1,348	90,316	65,930 68	1,740	67,860	46,144 80
Sweet potatoes.....bu.	8	800	800 00	17	850	654 50
Castor beans.....bu.						
Sorghum.....bu.	163		5,868 00	264		9,265 00
Flax.....bu.	1,597	15,970	13,574 50	2,026	18,234	18,234 00
Tobacco.....lbs.				2	600	60 00
Broom corn.....lbs.	145	72,500	2,175 00	18	10,800	378 00
Millet and hungarian.....tons	5,455	16,365	49,095 00	6,733	8,416	33,664 00
Milo maize.....tons	2	†	28 00	5	100	45 00
Kaffir corn.....tons	5	†	53 00	12	120	60 00
Jerusalem corn.....tons	8	†	48 00	1	20	10 00
Timothy.....tons	31,266	* 20,567	123,402 00	22,156	† 17,197	103,182 00
Clover.....tons	3,370			1,287		
Blue grass.....tons	927			1,860		
Alfalfa.....tons	102			151		
Orchard grass.....tons	34			20		
Other tame grasses.....tons	2,761			2,895		
Prairie grass, fenced.....tons	79,523	21,341	80,028 75	72,435	19,628	117,768 00
Totals.....	347,815		\$2,283,614 38	308,465		\$1,604,638 97

Wheat on hand March 1, 1893, 44,024 bushels; March 1, 1894, 15,096 bushels.

Corn on hand March 1, 1893, 892,805 bushels; March 1, 1894, 1,109,591 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—NEMAHA COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	347,815	\$2,283,614 38	308,465	\$1,604,638 97
Animals slaughtered and sold for slaughter.....		1,165,804 00		1,057,334 00
Milk sold.....		2,077 00		10,326 00
Poultry and eggs sold.....		58,417 00		62,051 00
Wool clip.....lbs.	5,077	812 32	4,680	608 40
Cheese.....lbs.	4,915	540 65	9,240	1,108 80
Butter.....lbs.	465,591	74,494 56	458,648	73,383 68
Garden products marketed.....		1,876 00		5,388 00
Horticultural products.....		384 00		1,626 00
Honey and beeswax.....lbs.	12,782	2,304 54	16,073	2,894 50
Wine manufactured.....gals.	4,312	4,312 00	5,720	5,720 00
Wood marketed.....		5,388 00		4,153 00
Totals.....		\$3,600,024 45		\$2,829,232 35

LIVE STOCK.—NEMAHIA COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	15,772	\$820,144 00	14,701	\$485,133 00
Mules and asses.....	1,272	78,864 00	1,415	59,430 00
Milch cows.....	10,975	219,500 00	9,011	198,242 00
Other cattle.....	24,877	422,909 00	23,810	428,580 00
Sheep.....	810	2,025 00	738	1,845 00
Swine.....	43,707	327,802 50	50,374	352,618 00
Totals.....	97,413	\$1,871,244 50	100,049	\$1,525,848 00

Number of dogs in county March 1, 1893, 2,152; March 1, 1894, 1,973.

Number of sheep killed by dogs, year ending March 1, 1894, 10.

Number of sheep killed by wolves, year ending March 1, 1894, 2.

NEOSHO COUNTY.

It was organized in 1864, has an area of 576 square miles, and ranks as the 27th county in population. The city of Erie, situated a little east of the center, lying on the Neosho river, is the county seat. Chanute, in the northwestern portion, and Osage Mission, in the southeastern, are places of much importance to the surrounding country. Thayer, situated in the southwestern portion, and Stark, in the northern, are of considerable local importance.

The railroads in the county are: The Southern Kansas, Girard & Pittsburg branch of the Southern Kansas, and Chicago, Kansas & Western, all of which are operated by the Atchison, Topeka & Santa Fé; Kansas City & Pacific; and the Missouri, Kansas & Texas.

Springs are not numerous, and well water is reached at an average depth of 20 feet. The Neosho river runs diagonally across the county from the northwest to the

POPULATION AND VALUATION.—NEOSHO COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	16,990	17,699	\$1,651,822	\$261,387	\$442,327	\$911,339	\$3,266,875
Big Creek twp.	908	924	\$137,142	\$10,043	.....	.....	\$147,185
Canaville twp.	939	1,024	124,660	5,973	\$5,299	\$90,899	226,831
Centerville twp.	1,036	998	137,246	10,720	7,111	48,853	203,930
Chetopa twp.	1,368	1,474	144,030	23,347	41,234	63,658	272,269
Erie city.....	1,062	1,091	.....	.....	.....	.....	.....
Erie twp.	927	894	1,985	133,760	23,854	61,511	98,040
Grant twp.	1,073	1,148	139,737	15,936	10,498	42,866	209,037
Ladore twp.	1,000	971	146,440	18,147	.....	104,284	268,871
Lincoln twp.	676	886	137,150	8,000	313	34,377	179,840
Osage Mission city...	934	1,000	.....	.....	.....	.....	.....
Mission twp.	759	859	1,859	22,595	53,140	78,229	280,539
Shiloh twp.	959	936	129,090	8,012	2,291	53,731	193,124
Chanute city.....	3,574	3,483	142,455	102,562	260,930	166,037	671,984
Tioga twp.	834	948	4,431	.....	.....	.....	.....
Walnut Grove twp.	941	1,063	153,537	12,198	.....	130,365	296,100

southeast. The general surface is a gently undulating prairie, 20 per cent. of it being in bottom land. The valley of the Neosho river averages a width of $2\frac{1}{2}$ miles, while the bottom lands on the creeks are from one-fourth to one mile wide. The county is well supplied with native timber, the belts along the streams having an average width of one-half mile. Among the varieties found are: Elm, cottonwood, hickory, oak, hackberry, black walnut, pecan, and maple. Many groves of artificial forest are on the upland farms, both the soil and the climate being adapted to tree growing.

The southwestern portion of the county, in the vicinity of Thayer, is becoming noted as a petroleum and natural gas producing region, and numerous wells are yielding these in considerable quantities.

Both limestone and sandstone exist in nearly every portion, and both are quarried extensively. Valuable quarries are in operation two miles northwest of the city of Chanute, yielding a superior quality of both limestone and sandstone. The former is used in the construction of buildings, and the latter in the building of bridge piers for railroads. A fine quality of sandstone is quarried at a point $2\frac{1}{2}$ miles southwest of the town of Thayer. Immense quarries of fine sandstone have been opened a short distance north of Erie; also, a quarry of stone strongly resembling a very superior quality of black marble, four miles northeast of the same point. In the southeastern part of the county, quarries of a fine quality of stone used for flagging are being worked. Clay is found and utilized, entering largely into the manufacture of excellent brick, at nearly all the towns in the county. Coal is mined in limited quantities in the southern portion.

FARM AND CROP STATISTICS.—NEOSHO COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	36,432	368,687	\$165,909 15	25,499	377,128	\$169,707 60
Spring wheat.....bu.	51			16		
Corn.....bu.	60,388	1,328,536	332,134 00	70,714	1,626,422	569,247 70
Oats.....bu.	29,937	538,866	107,773 20	29,479	488,160	126,921 60
Rye.....bu.	263			314	4,082	1,632 80
Barley.....bu.	20			12	120	48 00
Buckwheat.....bu.	19	171	128 25	2	16	9 60
Irish potatoes.....bu.	471	13,183	9,891 00	657	37,449	18,724 50
Sweet potatoes.....bu.	9	585	585 00	7	525	393 75
Castor beans.....bu.	689	4,134	4,754 10	1,078	8,624	8,624 00
Sorghum.....bu.	503		11,903 00	505		3,842 00
Flax.....bu.	6,144	49,152	41,779 20	9,049	81,441	81,441 00
Tobacco.....lbs.	1			1	1,200	120 00
Broom corn.....lbs.	1,164	523,800	10,476 00	604	362,400	9,060 00
Millet and hungarian, tons	2,335	4,086	16,344 00	2,028	2,535	12,675 00
Milo maize.....tons	5,002	† 10,004	35,014 00	16	400	180 00
Kaffir corn.....tons	2,832	† 11,328	39,648 00	711	17,775	8,887 50
Jerusalem corn.....tons	561	† 1,122	3,366 00	1	25	12 50
Timothy.....tons	12,205			14,671		
Clover.....tons	813			535		
Blue grass.....tons	947	* 9,328	55,968 00	1,340	† 8,491	50,946 00
Alfalfa.....tons	2,660			39		
Orchard grass.....tons	1,290			25		
Other tame grasses.....tons	2,519			235		
Prairie grass, fenced..tons	34,101	18,241	54,723 00	37,204	23,404	93,616 00
Totals.....	201,356		\$890,397 90	194,742		\$1,156,089 55

Wheat on hand March 1, 1893, 18,409 bushels; March 1, 1894, 49,411 bushels.

Corn on hand March 1, 1893, 195,900 bushels; March 1, 1894, 149,009 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—NEOSHO COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	201,356	\$890,397 90	194,742	\$1,156,089 55
Animals slaughtered and sold for slaughter.....		315,724 00		333,866 00
Milk sold.....		3,253 00		1,938 00
Poultry and eggs sold.....		46,783 00		59,080 00
Wool clip.....lbs.	884	141 44	550	71 50
Cheese.....lbs.	2,362	259 82	1,250	150 00
Butter.....lbs.	401,653	64,264 48	433,052	69,238 32
Garden products marketed.....		34,330 00		3,441 00
Horticultural products.....		3,129 00		1,448 00
Honey and beeswax.....lbs.	12,326	2,223 37	9,696	1,748 10
Wine manufactured.....gals.	976	976 00	746	746 00
Wood marketed.....		13,386 00		6,720 00
Totals.....		\$1,374,868 01		\$1,634,586 47

LIVE STOCK.—NEOSHO COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,846	\$563,992 00	11,130	\$367,290 00
Mules and asses.....	1,359	84,258 00	1,492	62,664 00
Milch cows.....	7,323	146,460 00	7,090	155,980 00
Other cattle.....	11,855	201,535 00	11,154	200,772 00
Sheep.....	85	212 50	104	260 00
Swine.....	14,545	109,087 50	17,405	121,835 00
Totals.....	46,013	\$1,105,545 00	48,375	\$908,801 00

Number of dogs in county March 1, 1893, 2,307; March 1, 1894, 2,066.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

NESS COUNTY.

Was organized in 1880; has an area of 1,080 square miles, ranking 78th in number of inhabitants. Ness City, on the Walnut river, a little south of the center, is the capital.

The Denver, Memphis & Atlantic, a part of the Missouri Pacific railroad system crosses the northern portion of the county, and the Chicago, Kansas & Western, operated by the Atchison, Topeka & Santa Fé, crosses the central portion from east to west.

The general surface is gently undulating, being very nearly level, while bottom lands are not very well defined, as the rise from the streams is gradual. There is not very much timber, the belts along the streams ranging from 3 to 40 rods in width, and contain ash, elm, hackberry, cottonwood, and box elder, as the principal varieties of trees. This timber is confined mostly to Walnut creek and its South Fork. But few springs exist, and well water is reached at an average depth of 35 feet. Walnut creek flows through the center of the county, with a course a little south of east.

Building stone is well distributed over the county. A very superior hard magnesian limestone is found in large quantities in the southeast quarter of the county, especially near Bazine, along the Chicago, Kansas & Western railroad, in layers a few feet under the surface. It is easily quarried and prepared in desired shapes. The

fencing in this part of the county is mostly made with stone posts. Many miles of wire fence with stone posts have been constructed, and give the best of satisfaction. This stone withstands water and freezing, and hardens when exposed to the weather. It is especially useful for curbing in low or damp soil, where many kinds of stone break into pieces by freezing. The layers are from 4 to 12 inches thick. Small quantities of coal have been discovered in many places in the county. Gypsum exists in very small quantities in all parts of the county. A native lime that is much used for building, especially for inside work, or where it is not exposed to moisture, is found in nearly every township.

POPULATION AND VALUATION.—NESS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	4,790	4,501	\$1,101,304	\$104,429	\$116,658	\$396,028	\$1,718,419
Bazine twp.....	655	482	\$134,499	\$5,571	\$1,950	\$56,566	\$198,586
Ness City.....	589 } 676	507 } 624	56,922	40,368	94,965	32,482	224,737
Center twp.....	87 } 262	117 } 242	89,580	4,685	1,307	47,757	143,329
Eden twp.....	538	453	182,710	11,631	4,647	.....	198,988
Franklin twp.....	262	195	80,965	6,759	54	38,025	125,803
Forrester twp.....	410	403	122,625	6,080	188	.....	128,893
Highpoint twp.....	275	345	91,634	5,141	1,217	.....	97,992
Johnson twp.....	673	617	107,266	10,845	6,729	71,719	196,559
Nevada twp.....	306	402	113,334	5,233	3,004	68,883	190,454
Ohio twp.....	769	738	121,769	8,116	2,597	80,596	213,078
Waring twp.....							

FARM AND CROP STATISTICS.—NESS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	73,832	.....	.....	75,184	108,264	\$41,140 32
Spring wheat.....bu.	375	.....	.....	62	6	2 10
Corn.....bu.	7,347	36,735	\$14,694 00	8,001	.....	.....
Oats.....bu.	3,979	.....	.....	2,170	210	63 00
Rye.....bu.	3,002	.....	.....	1,621	4,863	2,138 35
Barley.....bu.	13,608	.....	.....	9,965	49,825	19,930 00
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	224	11,200	11,200 00	250	3,750	3,375 00
Sweet potatoes.....bu.	11	385	385 00	3	30	30 00
Castor beans.....bu.	.....	.....	.....	5	20	20 00
Sorghum.....bu.	4,919	.....	37,182 00	5,971	.....	38,213 00
Flax.....bu.	24	96	81 60	29	58	58 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	1,665	832,500	20,812 00	1,704	85,200	1,704 00
Millet and hungarian, tons	1,366	2,732	13,660 00	3,624	3,624	18,120 00
Milo maize.....tons	96	† 288	1,008 00	36	720	324 00
Kaffir corn.....tons	1,716	† 5,148	18,018 00	2,261	22,610	11,305 00
Jerusalem corn.....tons	185	† 463	1,389 00	1,439	35,975	17,987 50
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	4	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	51	* 1,334	8,004 00	.....	† 6,871	41,226 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced..tons	33,669	2,197	8,788 00	30,974	3,648	14,592 00
Totals.....	146,069	.....	\$135,221 60	143,303	.....	\$210,228 27

Wheat on hand March 1, 1893, 52,486 bushels; March 1, 1894, 3,525 bushels.

Corn on hand March 1, 1893, 12,458 bushels; March 1, 1894, 1,576 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—NESS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	146,069	\$135,221 60	143,303	\$210,228 27
Animals slaughtered and sold for slaughter.....		36,658 00		65,656 00
Milk sold.....		689 00		
Poultry and eggs sold.....		11,187 00		20,138 00
Wool clip.....lbs.	120	19 20		
Cheese.....lbs.	1,105	121 55	6,250	750 00
Butter.....lbs.	107,055	17,128 80	197,630	31,620 80
Garden products marketed.....		6,369 00		963 00
Horticultural products.....		60 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	163	163 00		
Wood marketed.....		11 00		20 00
Totals.....		\$207,628 15		\$329,376 07

LIVE STOCK.—NESS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	5,614	\$291,928 00	5,691	\$187,803 00
Mules and asses.....	274	16,988 00	524	22,008 00
Milch cows.....	3,321	66,420 00	2,476	54,472 00
Other cattle.....	4,540	77,180 00	4,522	81,396 00
Sheep.....	284	710 00		
Swine.....	1,327	9,952 50	1,086	7,602 00
Totals.....	15,360	\$463,178 50	14,299	\$353,281 00

Number of dogs in county March 1, 1893, 659; March 1, 1894, 629.

NORTON COUNTY.

Was organized in 1872; contains 900 square miles, and ranks as the 60th in population in the state. The city of Norton, situated at the junction of the Chicago Rock Island & Pacific and a branch of the Missouri Pacific railroads, a little north, and east of the center, is the county seat. It also lies on Prairie Dog creek, and has two large roller process flouring mills. Its courthouse and school buildings are among the finest in northwestern Kansas.

The Republican Valley, Kansas & Southwestern, a branch of the Burlington & Missouri River railroad, and the Chicago, Rock Island & Pacific, cross the county from east to west; and the Atchison, Colorado & Pacific, of the Missouri Pacific system, extends nearly across the southern portion.

Bottom lands cover about 15 per cent. of the total area, the valley of the North Fork of the Solomon river ranging about $1\frac{1}{2}$ miles, and those on Prairie Dog and Sappa creeks one-half mile in width. Timber is not plentiful, the belts on the streams ranging from 10 to 40 rods in width, and having ash, cottonwood, elm, hackberry, cherry, box elder and walnut as the principal varieties of trees.

The county is well watered. Sappa creek crosses the northern portion, Prairie Dog the central, and the North Fork of the Solomon river the southern, all flowing

POPULATION AND VALUATION.—NORTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	9,891	9,711	\$1,631,537	\$319,541	\$216,659	\$505,968	\$2,673,705
Aldine twp.....	354	431	\$69,902	\$12,633	.....	.....	\$82,535
Almelo twp.....	237	251	44,238	931	.....	.....	45,169
Almena city.....	.....	402	.....	.....	.....	.....	.....
Almena twp.....	1,049	687 } 1,089	149,952	37,761	\$25,340	\$68,030	281,083
Belle Plaine twp.....	181	155	55,162	4,095	.....	.....	59,257
Norton city.....	1,133 } 1,699	1,005 } 1,574	122,847	90,315	149,295	77,068	439,525
Center twp.....	566 } 1,699	569 } 1,574	.....	.....	.....	.....	.....
Crystal twp.....	414	429	63,540	15,700	.....	.....	79,240
Emmett twp.....	329	438	79,714	24,271	930	76,240	181,155
Garfield twp.....	366	372	78,351	10,752	.....	.....	89,103
Grant twp.....	518	545	118,640	7,688	.....	20,291	146,619
Harrison twp.....	501	518	70,549	9,220	.....	.....	79,769
Highland twp.....	234	214	45,946	1,848	.....	.....	47,794
Lenora city.....	280 } 487	214 } 199	.....	.....	.....	.....	.....
Lenora twp.....	207 } 487	199 } 413	59,005	22,259	22,587	13,607	117,458
Leota twp.....	807	810	131,523	27,016	3,959	132,374	294,872
Lincoln twp.....	182	169	59,301	3,829	.....	6,948	70,078
Modell twp.....	291	220	71,592	5,669	.....	31,265	108,526
Noble twp.....	175	148	47,168	4,050	3,918	5,319	60,455
Orange twp.....	271	243	55,260	2,139	.....	.....	57,399
Rock Branch twp.....	389	399	65,525	15,795	1,305	.....	82,625
Rockwell twp.....	347	394	52,956	7,716	.....	20,785	81,457
Sand Creek twp.....	276	249	59,746	3,358	.....	.....	63,104
Solomon twp.....	439	320	57,915	4,586	8,258	20,637	91,396
West Union twp.....	345	330	72,705	7,910	1,067	33,404	115,086

FARM AND CROP STATISTICS.—NORTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	26,744	3,204	\$1,441 80	31,622	7,905	\$3,794 40
Spring wheat.....bu.	6,653	.....	.....	9,199	549	247 05
Corn.....bu.	102,401	716,807	215,042 10	149,197	447,591	223,795 50
Oats.....bu.	10,985	.....	.....	11,072	220	74 80
Rye.....bu.	7,810	.....	.....	5,285	15,855	7,134 75
Barley.....bu.	694	.....	.....	115	345	155 25
Buckwheat.....bu.	28	84	63 00	68	544	326 40
Irish potatoes.....bu.	911	18,220	11,843 00	1,201	48,040	39,873 20
Sweet potatoes.....bu.	.....	.....	.....	6	60	54 00
Castor beans.....bu.	2	6	6 90	3	12	12 00
Sorghum.....bu.	1,148	.....	14,461 00	1,542	.....	16,950 00
Cotton.....lbs.	.....	.....	.....	7	.....	.....
Flax.....bu.	.....	.....	.....	85	170	170 00
Tobacco.....lbs.	.....	.....	.....	1	300	30 00
Broom corn.....lbs.	570	285,000	7,125 00	475	.....	.....
Millet and hungarian, tons	2,581	1,935	9,675 00	5,867	5,867	29,335 00
Milo maize.....tons	4	12	42 00	1	10	4 50
Kaffir corn.....tons	53	159	556 00	69	345	172 50
Jerusalem corn.....tons	7	11	33 00	52	520	260 00
Timothy.....tons	79	.....	.....	16	.....	.....
Clover.....tons	7	.....	.....	23	.....	.....
Blue grass.....tons	1	.....	.....	5	.....	.....
Alfalfa.....tons	1,109	3,169	19,014 00	1,295	5,097	30,582 00
Orchard grass.....tons	.....	.....	.....	2	.....	.....
Other tame grasses.....tons	42	.....	.....	44	.....	.....
Prairie grass, fenced.....tons	32,692	8,922	44,610 00	95,407	10,035	40,140 00
Totals.....	194,521	.....	\$323,912 80	312,659	.....	\$393,111 35

Wheat on hand March 1, 1893, 79,614 bushels; March 1, 1894, 37,315 bushels.

Corn on hand March 1, 1893, 854,900 bushels; March 1, 1894, 421,081 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

from west to east. Several flouring mills are in the county, and there is ample power for several more.

Magnesian and hard limestone and sandstone are found along all the bluffs. A fair quality of potters' clay exists on the bottom lands. No workable coal veins have been discovered, although what are considered good indications exist in several localities.

Wells of excellent water are obtained at from 14 to 135 feet in depth.

SUMMARY.—NORTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	194,521	\$323,912 80	312,659	\$393,111 35
Animals slaughtered and sold for slaughter.....		304,009 00		601,074 00
Milk sold.....		137 00		850 00
Poultry and eggs sold.....		27,456 00		53,602 00
Wool clip.....lbs.	1,000	160 00	52	6 76
Cheese.....lbs.	2,300	253 00	2,550	306 00
Butter.....lbs.	292,320	46,771 20	388,966	62,234 56
Garden products marketed.....		4,305 00		2,791 00
Horticultural products.....		15,908 00		1,056 00
Honey and beeswax.....lbs.	1,406	253 15	1,408	253 44
Wine manufactured.....gals.	213	213 00	7	7 00
Wood marketed.....		254 00		393 00
Totals.....		\$723,632 15		\$1,115,685 22

LIVE STOCK.—NORTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	7,769	\$403,988 00	12,030	\$396,990 00
Mules and asses.....	659	40,858 00	973	40,866 00
Milk cows.....	5,115	102,300 00	6,200	136,400 00
Other cattle.....	11,875	201,875 00	12,825	230,850 00
Sheep.....	7,804	19,510 00	659	1,647 50
Swine.....	19,746	148,095 00	26,174	183,218 00
Totals.....	52,968	\$916,626 00	58,861	\$989,971 50

Number of dogs in county March 1, 1893, 1,335; March 1, 1894, 1,829.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 30.

OSAGE COUNTY.

It was organized in 1859, has an area of 720 square miles, and now ranks as the 15th county in point of population. Lyndon, situated near the center, is the county seat. Osage City, in the west-central portion, and Burlingame and Scranton in the northwestern, are thriving places, doing a large trade with the surrounding country. These and Carbondale, lying in the midst of the Osage coal belt, obtain a large prosperity from the mining interests.

The county is well supplied with railroad facilities, having the Atchison, Topeka & Santa Fé with a number of its branches, and members of the Missouri Pacific, extending into nearly every portion.

POPULATION AND VALUATION.—OSAGE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	23,324	23,788	\$1,882,649	\$689,291	\$563,130	\$1,091,527	\$4,226,597
Quenemo city.....	608 } 1,245	583 } 1,203	\$84,601	\$31,679	\$52,949	\$136,224	\$305,453
Agency twp.....	637 }	620 }					
Arvonla twp.....	641	679	133,810			14,376	148,186
Barclay twp.....	762	790	126,441	65,335		110,465	302,241
Burlingame city.....	1,368 }	1,363 }	190,821	93,998	108,458	75,743	469,020
Burlingame twp.....	1,400 }	1,387 }	114,205	31,101		38,529	183,835
Dragoon twp.....	708	713	139,562	47,590		63,622	250,774
Overbrook city.....	304 }	319 }	117,515	39,650			157,165
Elk twp.....	1,010 }	1,368 }	100,163	105,032	269,178	104,966	579,339
Fairfax twp.....	859	765	123,057	43,205		57,238	223,500
Osage City.....	3,667 }	3,566 }	73,234	13,845		30,877	117,956
Grant twp.....	741 }	953 }	113,895	38,687	16,493	41,026	210,101
Junction twp.....	1,104	1,165	149,150	44,125		48,134	241,409
Lincoln twp.....	662	616	100,975	40,125	28,207	93,056	262,363
Melvorn city.....	392 }	383 }	90,525	32,025	25,521	77,125	225,196
Melvorn twp.....	796 }	1,019 }	104,871	12,402		108,991	226,264
Olivet twp.....	783	811	119,824	50,492	62,324	91,155	323,795
Carbondale city.....	598 }	570 }					
Ridgeway twp.....	849 }	792 }					
Scranton city.....	1,617 }	1,569 }					
Scranton twp.....	830 }	800 }					
Peterton city.....	514 }	538 }					
Superior twp.....	850 }	775 }					
Lyndon city.....	870 }	853 }					
Valley Brook twp....	754 }	791 }					

FARM AND CROP STATISTICS.—OSAGE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	12,292	115,044	\$52,920 24	6,471	98,352	\$44,258 40
Spring wheat.....bu.	10					
Corn.....bu.	114,939	3,218,292	836,755 92	131,181	1,705,353	645,712 96
Oats.....bu.	20,917	439,257	92,243 97	13,737	226,644	63,460 32
Rye.....bu.	501	6,513	2,800 59	347	3,123	1,467 81
Barley.....bu.	25			25	625	250 00
Buckwheat.....bu.	41	410	307 50	44	352	211 20
Irish potatoes.....bu.	1,630	107,580	77,457 60	1,287	90,090	43,243 20
Sweet potatoes.....bu.	75	6,000	6,000 00	12	1,056	760 32
Castor beans.....bu.	70	420	483 00	10	100	100 00
Sorghum.....bu.	2,049		61,136 00	1,836		38,090 00
Flax.....bu.	914	7,312	6,215 20	1,396	12,564	12,564 00
Tobacco.....lbs.						
Broom corn.....lbs.	110	55,000	1,650 00	87		
Millet and hungarian..tons	6,302	12,604	50,416 00	6,329	9,493	37,972 00
Milo maize.....tons	33	132	462 00	13	325	146 25
Kafir corn.....tons	302	1,359	4,756 00	400	4,000	2,000 00
Jerusalem corn.....tons						
Timothy.....tons	14,825			17,558		
Clover.....tons	2,701			2,322		
Blue grass.....tons	1,274	* 8,758	52,548 00	1,486	† 13,085	78,510 00
Alfalfa.....tons	30			95		
Orchard grass.....tons	139			98		
Other tame grasses.....tons	1,469			281		
Prairie grass, fenced...tons	102,202	30,255	105,892 50	101,328	37,476	149,904 00
Totals.....	282,850		\$1,352,044 52	286,343		\$1,018,650 46

Wheat on hand March 1, 1893, 12,121 bushels; March 1, 1894, 22,981 bushels.

Corn on hand March 1, 1893, 889,481 bushels; March 1, 1894, 578,672 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

The general surface is an undulating prairie, but a small percentage being unfit for cultivation. Bottom lands cover 10 per cent. of the total area, and the valleys of streams have an average width of three-fourths of a mile. The county is well supplied with native timber, belts on the streams averaging three-eighths of a mile in width, and containing the following varieties of trees: Black walnut, elm, hackberry, hickory, pecan, oak, ash, cottonwood, sycamore, and cherry. Good springs are not numerous, and well water is obtained at a depth varying from 15 to 40 feet. The Marais des Cygnes river enters the county on the western border, seven miles north of the southwestern corner, and, flowing north of east, crosses the eastern boundary a little south of the center.

This county is one of the leading coal-producing counties in the state, the western half being underlaid a short distance from the surface with a good quality of bituminous coal. This bed is being mined at various points along the line of the Atchison, Topeka & Santa Fé railroad, notably at Carbondale, Scranton, Burlingame, Peterton, and Osage City, and large quantities are shipped both east and west. Magnesian limestone is found in the eastern portion, blue and gray limestone in the western, and a superior quality of sandstone in the northern portion. A good flagging stone is quarried near Osage City, and many of the wide pavements of Topeka and Emporia are constructed of it. A gray marble exists in Olivet township, in a stratum four feet in thickness, which takes a high polish when worked. Yellow ocher is found

SUMMARY.—OSAGE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops	282,850	\$1,352,044 52	286,343	\$1,018,650 46
Animals slaughtered and sold for slaughter		1,058,750 00		1,310,033 00
Milk sold		2,233 00		9,890 00
Poultry and eggs sold		51,743 00		57,168 00
Wool clip	1,685	269 60	8,950	1,163 50
Cheese	15,335	1,686 85	4,300	516 00
Butter	472,371	75,579 36	460,638	73,702 08
Garden products marketed		6,956 00		9,129 00
Horticultural products		4,051 00		1,415 00
Honey and beeswax	13,123	2,366 62	15,186	2,734 48
Wine manufactured	2,135	2,135 00	3,900	3,900 00
Wood marketed		5,922 00		1,041 00
Totals		\$2,563,736 95		\$2,489,342 12

LIVE STOCK.—OSAGE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	15,127	\$786,604 00	14,387	\$474,771 00
Mules and asses	979	60,698 00	1,055	44,310 00
Milch cows	10,041	200,820 00	9,974	219,428 00
Other cattle	28,806	489,702 00	34,190	615,420 00
Sheep	2,254	5,635 00	3,953	9,882 50
Swine	24,547	184,102 50	35,871	251,097 00
Totals	81,754	\$1,727,561 50	99,430	\$1,614,908 50

Number of dogs in county March 1, 1893, 3,110; March 1, 1894, 2,956.

Number of sheep killed by dogs, year ending March 1, 1894, 5.

Number of sheep killed by wolves, year ending March 1, 1894, 60.

OSBORNE COUNTY.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	10,987	11,196	\$1,782,450	\$375,689	\$258,898	\$251,359	\$2,668,395
Portis city		157 }					
Bethany twp.	550	441 }	\$100,460	\$14,560	\$20,040	\$30,879	\$165,939
Bloom twp.	563	589	82,400	15,290			97,690
Corinth twp.	312	415	102,390	12,320		10,234	124,944
Covert twp.	299	300	56,270	18,770	884		75,924
Delhi twp.	536	488	75,080	12,243			87,322
Grant twp.	341	393	65,430	7,830			73,260
Hancock twp.	330	345	65,080	13,954			79,034
Hawkeye twp.	369	396	66,820	6,755			73,575
Independence twp. .	285	305	66,400	12,430			78,830
Jackson twp.	404	307	67,975	13,714			81,689
Kill Creek twp.	261	295	66,850	8,260			75,110
Lawrence twp.	360	380	63,920	5,040			68,960
Liberty twp.	179	222	51,760	4,940		6,833	63,533
Mt. Ayr twp.	368	402	73,880	9,050			82,930
Natoma twp.	200	241	53,710	16,916	5,959	35,388	111,973
Osborne city.	1,082 }	1,028 }					
Penn twp.	484 }	533 }	138,080	78,820	97,724	39,852	354,476
Downs city.	1,002 }	861 }					
Ross twp.	619 }	626 }	113,000	44,950	104,866	50,089	312,905
Round Mound twp. .	249	291	65,910	5,980			71,890
Alton city.	430 }	393 }					
Summer twp.	438 }	453 }	115,955	35,230	28,332	44,101	223,618
Tilden twp.	463	460	96,090	8,280	1,093	33,983	139,446
Valley twp.	307	303	64,900	12,166			77,066
Victor twp.	301	308	72,930	7,131			80,061
Winfield twp.	255	264	57,160	11,060			68,220

being confined to narrow belts along the streams. These belts average a width of 30 rods, and contain the following varieties of trees: Oak, elm, cottonwood, ash, hackberry, box elder, willow, honey locust, mulberry, and walnut, the last three not being very abundant. Salt water is reached at a depth of 100 feet, near the city of Osborne. The county is moderately supplied with springs, and well water is reached at an average depth of 22 feet, good water having been obtained in several instances at a depth of less than 10 feet. The South Fork of the Solomon river enters the county on the western border, $8\frac{1}{2}$ miles south of the northwestern corner.

FARM AND CROP STATISTICS.—OSBORNE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	71,862	130,788	\$58,854 60	74,990	148,476	\$60,875 16
Spring wheat.....bu.	80			45		
Corn.....bu.	66,678	1,133,526	272,046 20	78,325	234,975	93,990 00
Oats.....bu.	10,547			5,792	11,584	3,938 56
Rye.....bu.	5,335	26,675	8,802 75	2,511	17,577	7,080 80
Barley.....bu.	697			174	522	208 80
Buckwheat.....bu.	17	136	102 00	39	312	187 20
Irish potatoes.....bu.	875	26,250	19,687 50	831	8,310	7,146 60
Sweet potatoes.....bu.	5	125	125 00	5	50	50 00
Castor beans.....bu.	17	85	97 75			
Sorghum.....bu.	987		6,214 00	1,580		8,295 00
Flax.....bu.	25	100	85 00	4	8	8 00
Tobacco.....lbs.						
Broom corn.....lbs.	1,557	700,650	21,019 50	1,027	308,100	6,162 00
Millet and hungarian, tons	1,837	3,214	9,642 00	3,028	2,271	6,813 00
Milo maize.....tons	22	† 88	308 00	17	170	76 50
Kaffir corn.....tons	321	† 1,284	4,494 00	769	7,690	3,845 00
Jerusalem corn.....tons	15	† 45	135 00	27	270	135 00
Timothy.....tons	72			11		
Clover.....tons	10					
Blue grass.....tons	68			44		
Alfalfa.....tons	1,759	* 3,062	18,372 00	2,422	† 3,562	21,372 00
Orchard grass.....tons	29					
Other tame grasses.....tons	56			1,585		
Prairie grass, fenced..tons	55,338	19,538	48,845 00	41,802	23,664	70,992 00
Totals.....	218,209		\$468,830 30	215,028		\$291,125 62

Wheat on hand March 1, 1893, 204,400 bushels; March 1, 1894, 82,369 bushels.

Corn on hand March 1, 1893, 604,924 bushels; March 1, 1894, 339,240 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—OSBORNE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	218,209	\$468,830 30	215,028	\$291,125 62
Animals slaughtered and sold for slaughter.....		377,857 00		497,775 00
Milk sold.....		1,993 00		1,140 00
Poultry and eggs sold.....		58,708 00		74,811 00
Wool clip.....lbs.	14,000	2,240 00	7,073	919 49
Cheese.....lbs.	15,110	1,662 10	11,625	1,395 00
Butter.....lbs.	356,499	57,039 84	363,138	58,102 08
Garden products marketed.....		3,188 00		1,273 00
Horticultural products.....				
Honey and beeswax.....lbs.	650	117 00	360	64 80
Wine manufactured.....gals.	184	184 00	70	70 00
Wood marketed.....		229 00		591 00
Totals.....		\$972,048 24		\$927,266 99

Magnesian limestone is found in all the bluffs and divides, and on the lower lands in the southern portion. A hard limestone is found in great abundance in the southern part, and makes excellent building material. It is also used commonly for fence posts, and is known in geology as post rock. Sandstone of inferior quality is found in several places. Fire clay is found near Osborne and Downs.

LIVE STOCK.—OSBORNE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	10,747	\$558,844 00	11,325	\$373,725 00
Mules and asses	601	37,262 00	618	25,956 00
Milch cows	6,968	139,360 00	6,436	141,592 00
Other cattle	18,172	308,924 00	14,880	267,840 00
Sheep	1,704	4,260 00	949	2,372 50
Swine	15,154	113,655 00	21,332	149,324 00
Totals	53,346	\$1,162,305 00	55,540	\$960,809 50

Number of dogs in county March 1, 1893, 1,644; March 1, 1894, 1,792.

Number of sheep killed by wolves, year ending March 1, 1894, 12.

OTTAWA COUNTY.

Was organized in 1866; has an area of 720 square miles, and ranks as the 51st county in the state in population. Minneapolis, situated on the Solomon river, a little west of the center, is the county seat. Bennington, in the southeast portion, and Delphos, in the northwest, are towns of much local importance.

The Chicago, Kansas & Western division of the Atchison, Topeka & Santa Fé railroad crosses the central portion of the county from east to west; the Union Pacific, Lincoln & Colorado, operated by the Union Pacific, enters the county in the southeastern corner, and crosses the county in a northwesterly direction.

The general surface is an undulating prairie, with a small area of rough lands on the divides, and long, rolling slopes, reaching to the bottoms along the streams. Bottom lands on the Solomon and Saline rivers average three miles in width, while those on the creeks are from one-half to one mile wide. The proportion of bottom land in the county is 25 per cent. of the total area.

The Solomon river enters the county from the north, 6½ miles east of the northwestern corner. It flows in a southeastern direction across the county, and crosses the southern border near the southeastern corner. Abundant water power is furnished by this stream, and is utilized by mills.

Limestone underlies the table-land in the western portion. Red sandstone is evenly distributed over the county, being accessible from any point. Red, orange and yellow ocher are found along small streams coming from the divides. Fire clay crops out along the creeks in the highlands in many places. A good quality of potters' clay is also found.

POPULATION AND VALUATION.—OTTAWA COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	11,705	11,250	\$1,556,190	\$366,931	\$310,960	\$409,181	\$2,643,262
Bennington city.....	357 } 744	335 } 750	\$75,070	\$16,407	\$23,513	\$16,472	\$131,462
Bennington twp.....	387 }	415 }					
Blaine twp.....	415	381	94,088	16,640	.....	18,282	129,010
Buckeye twp.....	390	385	84,115	6,338	823	33,695	124,971
Center twp.....	350	327	84,261	11,320	.....	31,613	127,194
Chapman twp.....	431	440	56,095	4,980	.....	12,475	73,550
Minneapolis city.....	1,804 } 2,224	1,647 } 2,048	99,259	123,180	214,420	60,335	497,194
Concord twp.....	420 }	401 }					
Culver city.....	109 }						
Culver twp.....	506 }	615	80,420	6,050	2,601	25,024	114,095
Durham twp.....	206	214	55,680	7,935	.....	1,104	64,719
Ada city.....	100 }						
Fountain twp.....	595 }	695	79,312	20,903	7,367	26,428	134,010
Garfield twp.....	485	524	110,932	21,740	.....	37,940	170,612
Grant twp.....	360	350	67,705	8,436	909	26,039	103,089
Henry twp.....	342	348	43,920	4,460	.....	890	49,270
Lincoln twp.....	536	475	86,908	16,121	3,244	13,788	120,061
Logan twp.....	601	558	85,260	12,490	.....	.....	97,750
Tescott city.....	259 }	281 }					
Morton twp.....	417 }	427 }	708	15,255	9,330	32,528	147,517
Ottawa twp.....	329	285	64,348	13,315	3,373	30,165	111,201
Richland twp.....	360	369	70,071	9,446	.....	1,922	81,439
Delphos city.....	538 } 1,038	491 }	113,122	32,901	45,380	40,481	231,884
Sheridan twp.....	500 }	431 }					
Sherman twp.....	449	400	63,655	12,864	.....	.....	76,519
Stanton twp.....	459	463	51,565	6,150	.....	.....	57,715

FARM AND CROP STATISTICS.—OTTAWA COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	75,089	176,455	\$79,404 75	71,974	492,300	\$194,997 00
Spring wheat.....bu.	26			43		
Corn.....bu.	71,282	712,820	213,846 00	72,732	363,660	152,737 20
Oats.....bu.	16,887	101,322	27,356 94	9,600	21,888	7,004 16
Rye.....bu.	1,055	2,110	738 50	567	5,670	2,381 40
Barley.....bu.	41	82	36 90	5	15	6 00
Buckwheat.....bu.	15	75	56 25	6	48	28 80
Irish potatoes.....bu.	857	21,425	18,211 25	584	9,344	7,101 40
Sweet potatoes.....bu.	4	120	120 00	6	174	130 50
Castor beans.....bu.						
Sorghum.....bu.	3,664		19,955 00	5,922		32,510 80
Flax.....bu.	40	120	102 00	8	16	16 00
Tobacco.....lbs.						
Broom corn.....lbs.		3,600	108 50	14		
Millet and hungarian..tons	1,192	2,086	6,258 00	841	841	4,205 00
Milo maize.....tons	19	57	199 00	24	120	54 00
Kaffir corn.....tons	453	1,812	6,342 00	3,139	15,695	7,847 50
Jerusalem corn.....tons	42	63	189 00	19	95	47 50
Timothy.....tons	655			342		
Clover.....tons	65			6		
Blue grass.....tons	246	* 2,371	14,226 00	208	† 2,582	15,492 00
Alfalfa.....tons	1,958			2,127		
Orchard grass.....tons	3					
Other tame grasses.....tons	60			20		
Prairie grass, fenced..tons	83,743	12,584	47,190 00	65,008	13,404	67,020 00
Totals.....	257,402		\$434,340 09	233,195		\$488,579 26

Wheat on hand March 1, 1893, 237,710 bushels; March 1, 1894, 101,520 bushels.

Corn on hand March 1, 1893, 200,800 bushels; March 1, 1894, 77,925 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—OTTAWA COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	257,402	\$434,340 09	233,195	\$488,579 26
Animals slaughtered and sold for slaughter.....		889,037 00		910,650 00
Milk sold.....		695 00		2,172 00
Poultry and eggs sold.....		31,159 00		31,228 00
Wool clip.....lbs.	24,630	3,940 80	4,719	613 47
Cheese.....lbs.	2,200	242 00	475	57 00
Butter.....lbs.	335,094	53,615 04	308,262	49,321 92
Garden products marketed.....		2,671 00		1,475 00
Horticultural products.....		7,370 00		1,451 00
Honey and beeswax.....lbs.	1,020	184 30	1,659	299 90
Wine manufactured.....gals.	504	504 00	68	68 00
Wood marketed.....		826 00		755 00
Totals.....		\$1,424,584 23		\$1,486,670 55

LIVE STOCK.—OTTAWA COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	9,778	\$508,456 00	9,864	\$325,512 00
Mules and asses.....	782	48,484 00	853	35,826 00
Milch cows.....	6,022	120,440 00	5,779	127,138 00
Other cattle.....	32,245	548,165 00	23,802	428,436 00
Sheep.....	830	2,075 00	854	2,135 00
Swine.....	14,388	107,910 00	13,750	96,250 00
Totals.....	64,045	\$1,335,530 00	54,902	\$1,015,297 00

Number of dogs in county March 1, 1893, 1,740; March 1, 1894, 1,602.

PAWNEE COUNTY.

It was organized in 1872, with a territory of 756 square miles, and now ranks as the 75th in population in the state. Larned, situated on the north bank of the Arkansas river, in the east-central portion, is the county seat.

The Atchison, Topeka & Santa Fé railroad enters the northeastern portion of the county, and crosses it diagonally. The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé, crosses the central portion from east to west.

The general surface is an undulating prairie; south of the Arkansas river it is nearly level, while north of that stream the land is more rolling. The bottoms of the Arkansas average four miles in width, and these with the other valleys constitute 25 per cent. of the county area. Springs are numerous, and well water is reached at a depth of from 6 to 10 feet on the Arkansas bottom, and at an average depth of 20 feet on the uplands. The Arkansas river flows across the county from the southwest to the northeast.

Magnesian limestone is found in the north and northwest portions of the county, and is used principally for building purposes. Sandstone, fire and potters' clay are found near the city of Larned. Ocher has been discovered on township 20, range 16, north of the same place.

POPULATION AND VALUATION.—PAWNEE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	5,331	5,144	\$1,429,215	\$203,020	\$437,119	\$456,985	\$2,529,319
Ash Valley twp.....	198	172	\$77,410	\$7,830	.....	.....	\$85,240
Brown's Grove twp...	290	285	109,460	8,985	\$8,875	\$30,000	157,320
Conkling twp.....	63	57	51,265	1,610	.....	.....	52,755
Garfield twp.....	405	426	117,690	14,540	7,053	107,525	246,808
Grant twp.....	161	172	108,335	6,730	.....	28,135	143,200
Keysville twp.....	207	225	98,400	4,620	.....	.....	103,020
Larned city.....	1,877	1,692	160,165	112,720	420,687	176,720	870,292
Larned twp.....	462	459	.....	.....	.....	.....	.....
Logan twp.....	211	212	93,455	3,085	504	20,080	120,124
Pawnee twp.....	298	281	156,115	13,190	.....	16,430	185,735
Pleasant Ridge twp...	171	197	84,860	5,470	.....	40,165	130,495
Pleasant Valley twp...	460	432	212,275	9,630	.....	8,150	230,055
River twp.....	288	290	73,305	5,935	.....	29,780	109,020
Walnut twp.....	240	244	86,480	8,775	.....	.....	95,255

FARM AND CROP STATISTICS.—PAWNEE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	86,693	76,288	\$30,515 20	104,332	109,548	\$41,628 24
Spring wheat.....bu.	696	.....	.....	31	.....	.....
Corn.....bu.	13,786	137,860	48,251 00	13,557	6,778	2,711 20
Oats.....bu.	8,229	65,832	23,041 20	6,028	9,762	3,123 84
Rye.....bu.	6,180	24,720	9,393 60	2,387	9,548	3,819 20
Barley.....bu.	7,805	31,220	10,302 60	3,662	14,648	5,859 20
Buckwheat.....bu.	13	39	29 25	9	72	43 20
Irish potatoes.....bu.	259	.....	.....	244	6,100	5,185 00
Sweet potatoes.....bu.	15	750	750 00	27	540	540 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	3,973	.....	30,984 00	4,385	.....	26,743 00
Flax.....bu.	138	552	469 20	5	10	10 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	1,514	605,600	12,112 00	1,042	156,300	3,907 50
Millet and hungarian, tons	3,579	1,789	7,156 00	4,418	4,418	22,090 00
Milo maize.....tons	157	235	823 00	175	1,750	787 50
Kaffir corn.....tons	309	613	2,163 00	1,650	16,500	8,250 00
Jerusalem corn.....tons	85	128	384 00	164	1,640	820 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	1	.....	.....
Blue grass.....tons	2	* 5,834	35,004 00	938	† 5,628	33,768 00
Alfalfa.....tons	520	.....	.....	.....	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	12,998	3,945	11,835 00	16,348	6,829	27,316 00
Totals.....	146,951	.....	\$223,213 05	159,403	.....	\$186,601 88

Wheat on hand March 1, 1893, 190,785 bushels; March 1, 1894, 42,438 bushels.

Corn on hand March 1, 1893, 16,215 bushels; March 1, 1894, 4,914 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—PAWNEE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	146,951	\$223,213 05	159,403	\$186,601 88
Animals slaughtered and sold for slaughter.....		66,177 00		50,647 00
Milk sold.....		888 00		163 00
Poultry and eggs sold.....		13,604 00		10,888 00
Wool clip.....lbs.	7,110	1,137 60	5,192	674 96
Cheese.....lbs.	3,025	332 75	210	25 20
Butter.....lbs.	143,031	22,884 96	150,805	24,128 80
Garden products marketed.....		2,051 00		811 00
Horticultural products.....		698 00		.....
Honey and beeswax.....lbs.	80	14 40	200	36 00
Wine manufactured.....gal.	53	53 00	20	20 00
Wood marketed.....		73 00		20 00
Totals.....		\$331,126 76		\$274,015 84

LIVE STOCK.—PAWNEE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	4,765	\$247,780 00	5,465	\$180,345 00
Mules and asses.....	367	22,754 00	451	18,942 00
Milch cows.....	2,708	54,160 00	2,430	53,460 00
Other cattle.....	5,828	99,076 00	3,789	68,202 00
Sheep.....	1,184	2,960 00	402	1,005 00
Swine.....	1,487	11,152 50	1,681	11,767 00
Totals.....	16,339	\$437,882 50	14,218	\$333,721 00

Number of dogs in county March 1, 1893, 640; March 1, 1894, 636.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

PHILLIPS COUNTY.

This now ranks as the 47th county in population. Phillipsburg, a little south of the center, is the county seat. Kirwin, Marvin, Logan, Long Island and Agra are places of local importance.

The railroads in the county are: The Chicago, Rock Island & Pacific; Republican Valley, Kansas & Southwestern, of the Burlington & Missouri River; and Atchison, Colorado & Pacific, of the Missouri Pacific system.

The general surface presents the appearance of a gently rolling prairie, with limestone bluffs occurring on the south side of the principal streams. Bottom lands are narrow, and, in the aggregate, cover 20 per cent. of the county area. Timber belts on the streams are very narrow, cottonwood, elm, ash, walnut and box elder being the principal varieties of trees. Well water is reached at an average depth of 10 feet on the bottoms, and at a much greater depth on the uplands. The North Fork of the Solomon river enters the county from the west, six miles north of the southwestern corner. It has a general eastern direction, and crosses the eastern border six miles north of the southeastern corner. Fine sheet water is obtained at an average depth of 45 feet.

POPULATION AND VALUATION.—PHILLIPS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	12,593	13,067	\$1,871,844	\$403,701	\$249,859	\$462,200	\$2,988,854
Arcade twp.....	503	532	\$76,635	\$5,498	\$922	\$44,000	\$127,055
Beaver twp.....	391	386	63,660	6,789	.....	.....	70,449
Belmont twp.....	397	407	61,840	7,239	620	33,570	103,269
Bow Creek twp.....	304	300	71,620	7,205	.....	.....	78,825
Crystal twp.....	476	516	73,580	6,509	.....	.....	80,089
Dayton twp.....	397	424	64,758	3,703	.....	.....	68,461
Deer Creek twp.....	467	493	79,900	14,721	.....	29,620	124,241
Freedom twp.....	332	425	69,696	8,084	.....	.....	77,780
Glenwood twp.....	288	326	68,288	3,966	47	.....	72,301
Granite twp.....	503	549	78,770	17,628	4,150	31,730	132,278
Greenwood twp.....	429	467	78,064	10,791	.....	.....	88,855
Kirwin city.....	699	560	.....	.....	.....	.....	.....
Kirwin twp.....	417	385	82,522	71,118	60,278	31,050	244,968
Logan city.....	430	390	.....	.....	.....	.....	.....
Logan twp.....	232	264	54,860	28,744	26,484	30,220	140,308
Long Island twp.....	760	834	114,423	57,471	11,334	35,290	218,518
Mound twp.....	471	465	83,634	13,147	993	46,900	144,674
Phillipsburg city.....	1,045	1,078	100,904	65,543	122,412	57,820	346,679
Phillipsburg twp.....	451	544	.....	.....	.....	.....	.....
Plainview twp.....	189	153	58,680	3,506	.....	.....	62,186
Plum twp.....	814	768	92,822	17,349	5,328	42,980	158,479
Prairie View twp.....	625	647	77,225	11,173	5,442	48,930	142,770
Rushville twp.....	249	280	56,340	3,082	.....	.....	59,422
Solomon twp.....	543	554	88,068	15,274	11,849	30,090	145,281
Sumner twp.....	459	460	66,855	8,037	.....	.....	74,892
Towanda twp.....	194	229	51,970	2,698	.....	.....	54,668
Valley twp.....	280	284	86,630	11,668	.....	.....	98,298
Walnut twp.....	248	347	71,350	2,758	.....	.....	74,108

FARM AND CROP STATISTICS.—PHILLIPS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	34,874	24,410	\$11,716 80	31,115	102,368	\$47,089 28
Spring wheat.....bu.	1,822	2,912	1,164 80	854	.....	.....
Corn.....bu.	109,872	878,976	219,744 00	116,872	350,616	164,789 52
Oats.....bu.	14,976	224,640	51,667 20	9,931	61,570	20,933 80
Rye.....bu.	8,741	69,928	23,775 52	5,999	41,993	17,637 06
Barley.....bu.	518	6,216	1,864 80	160	480	182 40
Buckwheat.....bu.	24	144	108 00	1	8	4 80
Irish potatoes.....bu.	1,419	39,732	32,977 56	1,133	22,660	18,128 00
Sweet potatoes.....bu.	2	46	46 00	1	6	7 20
Castor beans.....bu.	.....	.....	.....	10	40	40 00
Sorghum.....	815	.....	6,845 00	682	.....	5,937 20
Cotton.....lbs.	100	.....	.....	.....	.....	.....
Flax.....bu.	54	162	137 70	16	48	48 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	2,255	1,127,500	22,550 00	1,555	622,000	12,440 00
Millet and hungarian.....tons	2,844	4,266	21,330 00	3,616	4,520	22,600 00
Milo maize.....tons	32	†	96	12	120	54 00
Kaffir corn.....tons	87	†	261	116	2,320	1,160 00
Jerusalem corn.....tons	17	†	26	.....	.....	.....
Timothy.....tons	59	.....	78 00	6	.....	.....
Clover.....tons	14	.....	.....	.....	.....	.....
Blue grass.....tons	45	.....	.....	2	.....	.....
Alfalfa.....tons	559	* 2,722	16,332 00	668	† 1,640	9,840 00
Orchard grass.....tons	6	.....	.....	15	.....	.....
Other tame grasses.....tons	18	.....	.....	.....	.....	.....
Fralrie grass, fenced.....tons	58,985	19,194	91,171 50	57,994	16,546	82,730 00
Totals.....	238,138	.....	\$502,757 88	230,758	.....	\$403,621 26

Wheat on hand March 1, 1893, 72,745 bushels; March 1, 1894, 32,777 bushels.

Corn on hand March 1, 1893, 1,102,486 bushels; March 1, 1894, 414,209 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Magnesian limestone of excellent quality is quarried extensively in every portion of the county. In Granite township a quarry containing rock strongly resembling granite is being worked, and the product used in the construction of buildings. This rock is also found in the southern portion of the county. Clay for the manufacture of brick is found in all parts of the county. Near the city of Phillipsburg large quantities of a very fine quality are manufactured into brick, from which many of the best buildings in the county, including the courthouse, are constructed. Gypsum is found in the southern and northwestern portions.

SUMMARY.—PHILLIPS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	238,138	\$502,757 88	230,758	\$403,621 26
Animals slaughtered and sold for slaughter		375,458 00		459,411 00
Milk sold.....		743 00		2,495 00
Poultry and eggs sold.....		54,176 00		51,027 00
Wool clip.....lbs.	6,304	1,008 64	5,902	767 26
Cheese.....lbs.	7,475	822 25	1,600	192 00
Butter.....lbs.	418,773	67,003 68	397,150	63,544 00
Garden products marketed.....		2,018 00		849 00
Horticultural products.....		20,126 00		300 00
Honey and beeswax.....lbs.	541	97 38	325	57 50
Wine manufactured.....gals.	974	974 00	583	583 00
Wood marketed.....		488 00		561 00
Totals.....		\$1,025,672 83		\$983,408 02

LIVE STOCK.—PHILLIPS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,196	\$530,192 00	10,787	\$355,971 00
Mules and asses.....	687	42,594 00	837	35,154 00
Milch cows.....	7,140	142,800 00	6,349	139,678 00
Other cattle.....	14,104	239,768 00	13,572	244,296 00
Sheep.....	1,645	4,112 50	694	1,735 00
Swine.....	25,241	189,307 50	24,695	172,865 00
Totals.....	59,013	\$1,148,774 00	56,934	\$949,699 00

Number of dogs in county March 1, 1893, 2,023; March 1, 1894, 1,984.

POTTAWATOMIE COUNTY.

Was organized in 1856, prior to the admission of Kansas into the union. It has an area of 848 square miles, and ranks as the 33d in number of inhabitants. The Kansas river forms its southern boundary, and the Big Blue river its western. Westmoreland, situated near the center, is the county seat. Wamego, on the Kansas river, in the south-central portion, St. Mary's, on the north bank of the Kansas river, in the southeastern, are places of considerable importance. Onaga, in the northeastern portion, and Louisville, in the south central, have a large local trade.

At Laclede, on the Red Vermillion river, in the eastern portion of the county, an

POPULATION AND VALUATION.—POTTAWATOMIE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	16,850	16,176	\$2,554,610	\$764,466	\$416,145	\$527,939	\$4,263,800
Belvue twp.....	719	737	\$173,240	\$38,520	\$6,710	\$52,147	\$270,617
Blue twp.....	634	643	175,595	38,583	.....	53,700	267,878
Olsburg city.....	217 } 877	205 } 856	141,340	71,707	15,420	34,464	262,931
Blue Valley twp.....	650 }	650 }	.....	.....	.....	.....	.....
Center twp.....	408	445	99,635	25,845	2,430	.....	127,910
Clear Creek twp.....	591	659	71,890	16,101	11,517	41,033	140,541
Emmet twp.....	306	311	72,770	8,183	.....	.....	80,953
Havensville city.....	226 } 715	271 } 778	90,475	40,073	18,860	26,490	175,898
Grant twp.....	489 }	507 }	.....	.....	.....	.....	.....
Green twp.....	614	615	123,325	20,471	14,776	14,948	173,520
Lincoln twp.....	341	376	78,300	19,532	.....	.....	97,832
Lone Tree twp.....	502	492	68,845	18,442	.....	15,369	102,656
Louisville city.....	308 } 840	339 } 886	160,465	31,378	23,244	.....	215,087
Louisville twp.....	532 }	547 }	.....	.....	.....	.....	.....
Onaga city.....	403 } 1,048	474 } 1,100	131,365	74,384	43,015	35,009	283,803
Mill Creek twp.....	645 }	626 }	.....	.....	.....	.....	.....
Pottawatomie twp.....	925	839	198,715	55,165	2,365	.....	256,245
Westmoreland city.....	467 } 897	422 } 802	83,360	32,153	28,377	10,533	154,423
Rock Creek twp.....	430 }	380 }	.....	.....	.....	.....	.....
Shannon twp.....	574	621	98,270	16,282	3,280	39,609	157,441
Sherman twp.....	474	479	68,730	18,625	.....	.....	86,995
Spring Creek twp.....	345	337	93,280	9,536	.....	.....	102,816
St. Clere twp.....	314	295	65,715	18,609	2,469	.....	86,793
St. George twp.....	490	500	112,310	7,965	7,908	61,441	189,624
St. Mary's city.....	1,325 } 2,155	962 } 1,461	140,795	65,277	112,184	63,946	382,202
St. Mary's twp.....	830 }	499 }	.....	.....	.....	.....	.....
Union twp.....	572	544	96,995	15,254	.....	.....	112,249
Vienna twp.....	326	316	98,265	22,553	.....	.....	121,818
Wamego city.....	1,782 } 2,183	1,672 } 2,185	110,900	99,828	123,590	79,250	413,568
Wamego twp.....	401 }	413 }	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—POTTAWATOMIE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	17,313	164,808	\$77,459 76	11,597	129,872	\$55,844 96
Spring wheat.....bu.	.....	.....	.....	3	.....	.....
Corn.....bu.	121,659	3,041,475	882,027 76	112,025	675,150	237,352 50
Oats.....bu.	22,080	574,080	126,297 60	17,250	285,648	77,124 96
Rye.....bu.	1,062	19,116	7,264 08	760	12,920	5,555 63
Barley.....bu.	42	.....	.....	.....	.....	.....
Buckwheat.....bu.	36	288	216 00	12	96	57 60
Irish potatoes.....bu.	1,121	93,043	65,130 10	1,140	14,820	9,781 20
Sweet potatoes.....bu.	17	2,125	2,125 00	72	12,600	6,300 00
Castor beans.....bu.	.....	.....	.....	5	40	40 00
Sorghum.....bu.	213	.....	5,546 00	271	.....	4,460 00
Flax.....bu.	31	186	158 10	70	420	420 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	43	21,500	645 00	32	8,000	320 00
Millet and hungarian, tons	5,684	14,210	71,050 00	5,754	7,192	35,960 00
Milo maize.....tons	4	16	56 00	6	150	67 50
Kaffir corn.....tons	4	16	56 00	123	2,460	1,230 00
Jerusalem corn.....tons	18	36	108 00	.....	.....	.....
Timothy.....tons	8,370	.....	.....	5,880	.....	.....
Clover.....tons	1,291	.....	.....	326	.....	.....
Blue grass.....tons	1,722	.....	.....	1,134	.....	.....
Alfalfa.....tons	617	* 9,289	55,734 00	917	† 9,743	58,458 00
Orchard grass.....tons	84	.....	.....	78	.....	.....
Other tame grasses.....tons	122	.....	.....	280	.....	.....
Prairie grass, fenced.....tons	135,482	44,254	143,825 50	173,853	41,467	207,335 00
Totals.....	317,015	.....	\$1,437,698 80	332,588	.....	\$500,307 35

Wheat on hand March 1, 1893, 67,514 bushels; March 1, 1894, 57,647 bushels.

Corn on hand March 1, 1893, 682,931 bushels; March 1, 1894, 744,892 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

excellent water power is utilized by a large roller-process flouring mill; also at Louisville, on Rook creek, in the south-central portion. Two fine water powers are also found on the Big Blue river; one at Garrison, the other at Rocky Ford.

The Union Pacific railroad extends across the southern portion of the county, and the Kansas Central, operated by the Union Pacific, crosses the northern portion.

The general surface is rolling, with high bluffs on the Kansas and Blue rivers. Bottom lands average a width of two miles, and, in the aggregate, contain 25 per cent. of the total area. Timber belts on the streams are from 25 to 80 rods wide and contain the following varieties of trees: Oak, walnut, hickory, maple, elm, hackberry, locust, box elder, mulberry, cedar, willow, cottonwood, coffee bean, redbud, papaw, buckeye, and linn.

Fine limestone quarries, from which an excellent quality of building material is obtained, are found in nearly every portion of the county away from the valleys. The better class of buildings in the cities and towns of the county are constructed from this material. A fine bed of gypsum exists in Spring Creek township.

SUMMARY.—POTTAWATOMIE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	317,015	\$1,437,698 89	332,588	\$500,307 35
Animals slaughtered and sold for slaughter.....		1,217,625 00		1,198,305 00
Milk sold.....		2,557 00		3,533 00
Poultry and eggs sold.....		39,548 00		49,767 00
Wool clip.....lbs.	9,130	1,460 80	8,635	1,122 55
Cheese.....lbs.			197	23 64
Butter.....lbs.	411,948	65,911 68	359,100	57,456 00
Garden products marketed.....		1,192 00		2,423 00
Horticultural products.....		3,552 00		3,571 00
Honey and beeswax.....lbs.	6,126	1,108 42	7,887	1,408 86
Wine manufactured.....gals.	8,080	8,080 00	10,841	10,841 00
Wood marketed.....		5,544 00		4,865 00
Totals.....		\$2,784,077 79		\$1,833,643 40

LIVE STOCK.—POTTAWATOMIE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	13,494	\$701,688 00	14,563	\$480,579 00
Mules and asses.....	774	47,988 00	779	32,718 00
Milch cows.....	10,872	217,440 00	9,881	217,382 00
Other cattle.....	32,958	560,286 00	31,145	560,610 00
Sheep.....	991	2,477 50	3,032	7,580 00
Swine.....	30,738	230,535 00	37,924	265,468 00
Totals.....	89,827	\$1,760,414 50	97,324	\$1,564,337 00

Number of dogs in county March 1, 1893, 2,195; March 1, 1894, 2,072.

PRATT COUNTY.

Has a territory of 720 square miles. It was organized in 1879, and now ranks as the 67th county in population. The town of Pratt, situated in the center, is the county seat.

POPULATION AND VALUATION.—PRATT COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	8,891	7,509	\$1,512,188	\$240,065	\$242,457	\$510,200	\$2,504,909
Banner twp.....	401	300	\$78,219	\$11,074	\$4,724	\$58,562	\$152,579
Carmi twp.....	393	352	77,890	5,491	.....	35,829	119,209
Pratt city.....	2,110	1,569	110,911	104,140	207,071	52,876	474,998
Center twp.....	327	288	.....	.....	.....	.....	.....
Elm twp.....	365	300	73,338	6,459	3,369	30,192	113,358
Gove twp.....	264	229	66,278	2,570	.....	1,928	70,776
Grant twp.....	430	377	80,823	13,959	2,263	28,971	126,016
Haynesville twp.....	760	736	113,610	17,930	5,157	56,102	192,799
Iuka twp.....	738	703	154,101	14,336	5,143	42,297	215,877
Logan twp.....	312	236	63,833	3,958	.....	38,991	106,782
McClelland twp.....	278	218	125,034	5,413	.....	33	130,480
McPherson twp.....	431	367	86,444	9,272	.....	9,081	104,797
Naron twp.....	445	446	104,936	6,371	.....	.....	111,307
Paxon twp.....	473	401	81,446	8,850	3,369	28,825	122,490
Richland twp.....	279	289	84,581	10,841	4,724	59,742	159,888
Saratoga twp.....	210	198	37,245	8,000	5,111	9,873	60,229
Springvale twp.....	204	182	67,865	5,200	1,082	30,031	104,178
Valley twp.....	471	318	105,634	6,201	444	26,867	139,146

FARM AND CROP STATISTICS.—PRATT COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	123,847	852,064	\$340,825 60	117,646	164,704	\$59,293 44
Spring wheat.....bu.	.....	.....	.....	.....	.....	.....
Corn.....bu.	33,638	100,914	38,347 32	36,699	220,194	77,067 90
Oats.....bu.	16,872	253,080	75,924 00	8,670	35,277	10,583 10
Rye.....bu.	849	10,188	4,880 84	385	3,465	1,212 75
Barley.....bu.	3,356	40,272	15,303 36	1,658	24,870	9,948 00
Buckwheat.....bu.	4	12	9 00	32	256	153 60
Irish potatoes.....bu.	340	16,320	12,729 60	125	3,750	3,187 50
Sweet potatoes.....bu.	10	250	250 00	19	760	684 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	540	.....	8,100 00	407	.....	4,298 00
Flax.....bu.	14	70	59 50	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	685	342,500	8,562 50	587	293,500	10,272 50
Millet and hungarian, tons	452	452	1,808 00	249	124	620 00
Milo maize.....tons	5	15	53 00	60	1,800	810 00
Kaffir corn.....tons	303	909	3,181 00	1,499	22,485	11,242 50
Jerusalem corn.....tons	.....	.....	.....	20	400	200 00
Timothy.....tons	21	.....	.....	2	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	10	.....	.....	10	.....	.....
Alfalfa.....tons	181	291	1,746 00	157	173	1,038 00
Orchard grass.....tons	7	.....	.....	.....	.....	.....
Other tame grasses.....tons	5	.....	.....	8	.....	.....
Prairie grass, fenced..tons	30,286	2,350	10,575 00	21,178	1,238	6,190 00
Totals.....	211,425	.....	\$521,854 72	189,411	.....	\$196,801 29

Wheat on hand March 1, 1893, 96,816 bushels; March 1, 1894, 16,877 bushels.

Corn on hand March 1, 1893, 46,651 bushels; March 1, 1894, 4,968 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The railroads in the county are: The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé; Kansas Southwestern, of the Missouri Pacific; and the Chicago, Rock Island & Pacific; also Wichita & Western.

The surface is gently rolling prairie, there being very little land in the county unfit for cultivation. Bottom lands range from one-fourth to a mile in width, and cover about 8 per cent. of the county area. Small groves of timber, some places one-fourth of a mile in width, are interspersed along the margins of streams, and contain the following varieties of trees: Walnut, ash, elm, mulberry, cottonwood, and hackberry. Groves of cultivated trees dot the prairies, and contain maple, cottonwood, mulberry, walnut, box elder, and spruce. Springs are not plentiful, while well water is reached at an average depth of 20 feet. There are but few important water courses in the county. The Ninneseah river has its head waters in the central portion, and flows east over the eastern boundary at about its center. Turkey creek, in the southwestern portion, flows south out of the county. Elm creek, and several small tributaries, have their sources in the extreme south-central portion, and flow south.

Sandstone of poor quality is found in the southwestern portion, and gypsum in the southern portion. The county is underlaid with salt. While boring a test well at the city of Pratt, the drill found a deposit of salt 400 feet in thickness.

SUMMARY.—PRATT COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	211,425	\$521,854 72	189,411	\$196,801 29
Animals slaughtered and sold for slaughter.....		114,316 00		160,457 00
Milk sold.....		72 00		609 00
Poultry and eggs sold.....		13,627 00		11,727 00
Wool clip.....lbs.	349	55 84	84	10 92
Cheese.....lbs.	1,555	171 05	2,620	314 40
Butter.....lbs.	153,631	24,580 96	128,791	20,606 56
Garden products marketed.....		2,912 00		466 00
Horticultural products.....		165 00		74 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	233	233 00	2	2 00
Wood marketed.....				
Totals.....		\$677,987 57		\$391,068 17

LIVE STOCK.—PRATT COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,231	\$168,012 00	4,842	\$159,786 00
Mules and asses.....	1,214	75,268 00	946	39,732 00
Milch cows.....	2,995	59,900 00	2,296	50,512 00
Other cattle.....	4,026	68,442 00	1,892	34,056 00
Sheep.....	50	125 00	122	305 00
Swine.....	4,554	34,155 00	3,577	25,039 00
Totals.....	16,070	\$405,902 00	13,675	\$309,430 00

Number of dogs in county March 1, 1893, 1,011; March 1, 1894, 941.

RAWLINS COUNTY.

It was organized in 1881, has a territory of 1,080 square miles, and now ranks as the 71st county in point of population. Atwood, on the east bank of Beaver creek, a little north and east of the center, is the county seat. There are no large towns in the county, although there are several trading points that transact a large business with the surrounding country.

The Beaver Valley railroad, operated by the Burlington & Missouri River system, crosses the county through the northern portion.

The general surface is an undulating prairie, with very few bluffs or rough lands. The valleys of the streams average one mile in width, and are fringed with belts of timber. Ash, elm, cottonwood, box elder and hackberry are the principal varieties of trees. Springs are plentiful, while well water is reached on the divides at a depth of from 25 to 175 feet. Beaver creek enters the county two miles north of the southwestern corner, and, flowing in a northeastern direction, crosses the eastern boundary six miles south of the northeastern corner.

A good quality of magnesian limestone is found on all the streams, and a superior sandstone, suitable for building, has been discovered in several localities. A native lime exists in most all of the draws that enter the streams from the south banks.

FARM AND CROP STATISTICS.—RAWLINS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	20,224	6,066	\$2,669 04	24,395	8,535	\$3,926 10
Spring wheat.....bu.	35,416	10,623	4,249 20	26,133	3,918	1,666 38
Corn.....bu.	53,762	537,620	139,781 20	60,712	182,136	81,961 20
Oats.....bu.	9,883	59,298	14,824 50	7,200	720	244 80
Rye.....bu.	3,751			2,785	13,925	5,570 00
Barley.....bu.	5,816			2,937		
Buckwheat.....bu.	12	72	54 00	1	8	4 80
Irish potatoes.....bu.	1,027	28,756	17,253 60	964	23,136	19,896 96
Sweet potatoes.....bu.	3	120	120 00	1	5	3 75
Castor beans.....bu.	5	15	17 25	15	60	60 00
Sorghum.....bu.	1,737		16,830 00	2,573		15,692 00
Flax.....bu.	167	1,336	1,135 60	62	248	248 00
Tobacco.....lbs.				3		
Broom corn.....lbs.	3,697	1,293,950	25,879 00	1,892	378,400	9,460 00
Millet and hungarian, tons	2,644	3,966	19,830 00	4,564	3,423	17,115 00
Milo maize.....tons		†		4	60	27 00
Kaffir corn.....tons	3	†	21 00	14	140	70 00
Jerusalem corn.....tons	57	†	258 00	74	1,110	555 00
Timothy.....tons	10			13		
Clover.....tons	23					
Blue grass.....tons	1			1		
Alfalfa.....tons	528	* 1,959	11,754 00	582	† 3,496	20,976 00
Orchard grass.....tons	4					
Other tame grasses.....tons	18			8		
Prairie grass, fenced.....tons	19,834	5,753	27,326 75	8,352	3,468	20,808 00
Totals.....	158,622		\$282,003 14	143,285		\$198,224 99

Wheat on hand March 1, 1893, 100,193 bushels; March 1, 1894, 34,493 bushels.

Corn on hand March 1, 1893, 294,762 bushels; March 1, 1894, 149,166 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

POPULATION AND VALUATION.—RAWLINS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	6,101	6,217	\$1 227,305	\$136,640	\$84,344	\$177,830	\$1,667,699
Achilles twp.....	191	211	\$66,240	\$6,710	\$473		\$73,423
Arbor twp.....	162	165	40,150	2,610			42,760
Atwood city.....	533	737	71,150	31,560	50,400	\$19,206	172,316
Atwood twp.....	204	242	47,090	3,870			50,960
Beaver twp.....	535	607	115,240	7,780			123,020
Burntwood twp.....	471	527	127,870	15,820	5,634	59,294	208,618
Cella twp.....	288	386	83,270	5,730	613		89,613
Clinton twp.....	495	501	86,240	9,180			95,420
Driftwood twp.....	280	255	44,510	2,110			46,620
Elk twp.....	130	130					41,590
Grant twp.....	517	595	67,215	10,280	9,460	39,943	126,898
Herndon twp.....	194	170	54,640	6,680			61,320
Jefferson twp.....	204	265	43,130	2,570			45,700
Laing twp.....	234	278	45,660	9,920	12,499	29,088	97,167
Logan twp.....	350	311	46,760	8,710	5,265	30,299	91,034
Ludell twp.....	128	137	35,810	3,510			39,320
Mikecell twp.....	226	192	71,010	1,960			72,970
Mirage twp.....	299	357	48,890	2,430			51,310
Richland twp.....	256	270	67,250	2,370			69,620
Rotate twp.....	172	141	65,180	2,840			68,020
Union twp.....							

SUMMARY.—RAWLINS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	158,622	\$282,003 14	143,285	\$198,224 99
Animals slaughtered and sold for slaughter.....		119,404 00		203,229 00
Milk sold.....		700 00		566 00
Poultry and eggs sold.....		13,718 00		16,300 00
Wool clip.....lbs.	4,010	641 60	3,431	446 03
Cheese.....lbs.	828	91 08	195	23 40
Butter.....lbs.	148,890	23,822 40	134,179	21,468 64
Garden products marketed.....		5,814 00		2,456 00
Horticultural products.....		1,832 00		40 00
Honey and beeswax.....lbs.	160	28 80	130	23 40
Wine manufactured.....gals.	28	28 00	223	223 00
Wood marketed.....		248 00		46 00
Totals.....		\$448,331 02		\$443,046 46

LIVE STOCK.—RAWLINS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	9,361	\$486,772 00	6,046	\$199,518 00
Mules and asses.....	389	24,118 00	400	16,800 00
Milch cows.....	3,380	67,600 00	2,868	63,096 00
Other cattle.....	5,512	93,704 00	3,619	65,142 00
Sheep.....	853	2,132 50	470	1,175 00
Swine.....	10,740	80,550 00	13,404	93,828 00
Totals.....	\$30,235	\$754,876 50	\$26,807	\$439,559 00

Number of dogs in county March 1, 1893, 1,050; March 1, 1894, 1,087.

Number of sheep killed by dogs, year ending March 1, 1894, 7.

Number of sheep killed by wolves, year ending March 1, 1894, 15.

RENO COUNTY.

Was organized in 1872; has an area of 1,260 square miles, and ranks 10th in number of inhabitants. The city of Hutchinson, lying on the north bank of the Arkansas river, is the county seat. At the city of Nickerson, in the north-central portion, repair shops of the Atchison, Topeka & Santa Fé railroad are located, affording employment to many mechanics.

The Atchison, Topeka & Santa Fé, Missouri Pacific, St. Louis & San Francisco, and Chicago, Rock Island & Pacific systems; also Hutchinson & Southern, afford ample railroad facilities.

The general surface is a gently undulating prairie, some portions being nearly level. The valley of the Arkansas has an average width of five miles, in some places spreading out to a width of 10 miles. On the Ninnescah and smaller streams, bottom lands average one-half mile in width. Small fringes of timber, composed principally of cottonwood and box elder, occur on the Arkansas and Ninnescah. Springs are abundant in all sections, and well water is reached at an average depth of 10 feet on the bottoms, and at 35 on the uplands; occasionally a depth of 50 feet must be reached to secure an abundance of water. The Arkansas river enters the county from the north, a little west of the center of the northern boundary. It flows in a southeastern direction, crossing the eastern border three miles south of the center.

POPULATION AND VALUATION.—RENO COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	27,139	26,066	\$2,851,278	\$494,215	\$1,149,586	\$1,270,679	\$5,765,758
Albion twp.....	645	581	\$76,630	\$8,370	\$1,764	\$29,250	\$116,014
Arlington city.....	365 } 644	321 } 625	61,229	6,405	10,046	39,646	117,326
Arlington twp.....	279 }	304 }					
Bell twp.....	484	435	60,090	4,917	228	2,433	67,668
Castleton twp.....	414	380	94,655	12,070	480	28,260	135,465
Center twp.....	582	530	104,370	12,620	5,480	88,599	211,069
Clay twp.....	509	572	150,890	10,380	.....	77,773	239,043
Enterprise twp.....	497	496	73,780	7,683	.....	.....	81,463
Nickerson city.....	1,808 } 2,355	1,261 } 1,601	124,027	28,712	90,403	201,261	444,403
Grant twp.....	547 }	340 }					
Grove twp.....	894	857	101,955	9,700	8,804	99,738	220,197
Haven twp.....	1,431	1,390	233,240	25,330	10,912	49,317	318,799
Hayes twp.....	511	606	102,410	15,720	.....	.....	118,130
Huntsville twp.....	511	500	79,180	4,550	.....	.....	83,730
Langdon twp.....	454	464	56,650	4,800	930	39,969	102,349
Lincoln twp.....	779	809	190,820	23,250	580	56,980	271,630
Little River twp.....	803	846	86,755	11,080	2,970	23,425	124,230
Loda twp.....	517	467	55,460	4,130	.....	.....	69,690
Medford twp.....	480	498	83,952	10,170	.....	.....	94,122
Medora twp.....	292	242	45,795	3,860	949	62,054	112,658
Ninnescah twp.....	309	438	66,090	4,370	.....	.....	70,460
Plevna twp.....	354	386	58,070	6,470	2,650	36,171	103,361
Hutchinson city.....	8,859 } 9,404	8,797 } 9,303	226,295	213,275	1,002,148	269,313	1,711,031
Reno twp.....	545 }	506 }					
Roscoe twp.....	322	327	72,700	1,290	.....	.....	73,990
Salt Creek twp.....	705	644	144,370	15,188	.....	.....	159,558
Sumner twp.....	485	430	84,810	2,630	.....	.....	87,440
Sylvia city.....	182 } 532	208 } 530	50,795	14,460	8,732	39,097	113,084
Sylvia twp.....	350 }	322 }					
Troy twp.....	261	263	69,870	5,790	.....	.....	75,660
Valley twp.....	866	812	159,600	9,980	.....	84,158	253,738
Walnut twp.....	657	565	71,980	11,550	.....	.....	83,530
Westminster twp.....	442	469	64,810	5,465	2,510	43,235	116,020

Limestone is found in the northeastern and southeastern portions, and an inferior quality of red sandstone in the northeastern, and on the North Fork of the Ninescah river, between Arlington and Castleton. Mineral paint is also found on the Ninescah. Extensive deposits of salt have been discovered. At the city of Hutchinson, mines of superior quality of rock salt, several miles in extent, at a depth of 300 feet, are being worked. Several companies have their works, and are in successful operation, employing vast capital, and giving employment to a large number of men. Salt of excellent quality has also been found in large quantities in the vicinity of Arlington, southwest of the center of the county.

FARM AND CROP STATISTICS.—RENO COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	118,698	807,144	\$339,000 48	103,380	325,647	\$120,489 39
Spring wheat.....bu.	10			105		
Corn.....bu.	139,775	1,817,075	508,781 00	162,645	2,114,385	909,185 55
Oats.....bu.	35,781	465,153	102,333 66	30,028	109,298	32,789 40
Rye.....bu.	2,060	20,600	7,210 00	2,201	15,407	6,162 80
Barley.....bu.	288	2,880	1,152 00	220	880	352 00
Buckwheat.....bu.	1					
Irish potatoes.....bu.	1,065	26,625	21,300 00	785	32,185	23,495 05
Sweet potatoes.....bu.	112	5,600	5,600 00	68	3,740	2,879 80
Castor beans.....bu.						
Sorghum.....bu.	877		9,464 00	1,888		14,095 00
Flax.....bu.	70	350	297 50	6	18	18 00
Tobacco.....lbs.						
Broom corn.....lbs.	4,025	1,811,250	54,337 50	3,564	1,425,600	35,640 00
Millet and hungarian, tons	2,849	2,136	8,544 00	2,625	5,250	21,000 00
Milo maize.....tons				77	† 1,540	693 00
Kaffir corn.....tons	61	† 183	640 00	1,003	20,060	10,030 00
Jerusalem corn.....tons				5	† 50	25 00
Timothy.....tons	99			50		
Clover.....tons	115			46		
Blue grass.....tons	1			52		
Alfalfa.....tons	1,835	* 3,087	18,522 00	3,447	† 4,433	26,598 00
Orchard grass.....tons	14			23		
Other tame grasses.....tons	14			58		
Prairie grass, fenced.....tons	101,208	39,423	197,115 00	120,110	22,501	90,004 00
Totals.....	408,958		\$1,274,297 14	432,386		\$1,293,456 99

Wheat on hand March 1, 1893, 306,167 bushels; March 1, 1894, 183,237 bushels.

Corn on hand March 1, 1893, 1,137,431 bushels; March 1, 1894, 305,204 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—RENO COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	408,958	\$1,274,297 14	432,386	\$1,293,456 99
Animals slaughtered and sold for slaughter.....		884,679 00		767,617 00
Milk sold.....		9,664 00		3,038 00
Poultry and eggs sold.....		56,994 00		54,423 00
Wool clip.....lbs.	2,910	465 60	910	118 30
Cheese.....lbs.	11,930	1,312 30	21,955	2,634 60
Butter.....lbs.	478,414	76,546 24	501,842	80,294 72
Garden products marketed.....		17,964 00		11,413 00
Horticultural products.....		25,779 00		23,794 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	6,362	6,362 00	3,466	3,466 00
Wood marketed.....		421 00		346 00
Totals.....		\$2,354,484 28		\$2,241,601 61

LIVE STOCK.—RENO COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	15,686	\$815,672 00	14,619	\$482,427 00
Mules and asses.....	2,118	131,316 00	2,047	85,974 00
Milch cows.....	10,555	211,100 00	9,758	214,676 00
Other cattle.....	30,314	515,338 00	22,182	399,276 00
Sheep.....	574	1,435 00	1,839	4,597 50
Swine.....	34,614	259,605 00	33,078	231,546 00
Totals.....	93,861	\$1,934,466 00	83,523	\$1,418,496 50

Number of dogs in county March 1, 1893, 2,775; March 1, 1894, 2,561.

Number of sheep killed by dogs, year ending March 1, 1894, 5.

Number of sheep killed by wolves, year ending March 1, 1894, 3.

REPUBLIC COUNTY.

Organized in 1868; contains an area of 720 square miles, and ranks as the 30th county in population. Belleville, lying very near the center, is the county seat. Scandia, lying on the east bank of the Republican river, in the west-central portion, is a growing town of much local importance. Cuba, in the east-central portion, transacts a considerable trade with the surrounding country.

Divisions of the Atchison, Topeka & Santa Fé, Union Pacific, Burlington & Missouri River, Missouri Pacific and the Chicago, Rock Island & Pacific railroads have their extensions in the county.

About 75 per cent. of the general surface is an undulating prairie, while the re-

POPULATION AND VALUATION.—REPUBLIC COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	17,047	16,771	\$1,724,683	\$368,839	\$257,191	\$872,340	\$3,223,053
Albion twp.....	698	816	\$91,964	\$17,405	\$7,193	\$49,456	\$166,018
Beaver twp.....	592	609	72,960	14,954	1,076	29,489	118,479
Belleville city.....	1,713	1,714	95,125	55,573	156,154	94,735	401,587
Belleville twp.....	672 } 2,385	667 } 2,381					
Republic city.....	200	170					
Warwick city.....	90 } 834	664	82,344	31,680	13,600	85,672	213,296
Big Bend twp.....	544 } 908	494					
Courtland city.....	274 } 664	264					
Courtland twp.....	634 } 908	626	87,585	18,221	12,460	74,517	192,783
Elk Creek twp.....	769	688	88,495	16,869	2,355	43,240	150,959
Fairview twp.....	773	814	93,615	16,907	1,675	72,517	184,714
Farmington twp.....	739	684	85,889	9,499	230	15,097	110,715
Freedom twp.....	646	647	90,268	12,010		14,107	116,385
Grant twp.....	778	752	78,466	16,720	6,150	64,221	165,557
Jefferson twp.....	705	687	77,613	4,720		36,921	119,254
Liberty twp.....	788	721	89,160	13,989			103,149
Lincoln twp.....	655	654	81,705	9,095		3,414	94,214
Norway twp.....	642	662	73,138	11,164	557	34,015	118,874
Cuba city.....	397 } 1,115	426 } 1,188	77,764	17,745	23,311	62,102	180,922
Richland twp.....	718 } 1,115	762 } 1,188					
Rose Creek twp.....	764	773	99,758	20,311		65,393	185,462
Scandia city.....	540 } 1,233	638 } 1,341	91,611	28,300	30,783	79,363	230,057
Scandia twp.....	693 } 1,233	703 } 1,341					
Union twp.....	733	733	97,258	23,967		28,909	150,134
Washington twp.....	711	460	92,470	12,570	1,308	19,172	125,520
White Rock twp.....	579	607	77,495	17,140	339		94,974

mainder is nearly level, but with good drainage. Bottoms average two miles in width on the Republican river, and from one-half to one mile on the creeks; and these, in the aggregate, comprise 10 per cent. of the county area. Timber belts are from four rods to one-half mile in width, and contain the following varieties of trees: Elm, hackberry, oak, walnut, locust, cottonwood, ash, and willow. In many places the timber has all been cut, and its place is being filled with young ash trees, which grow with great rapidity. Springs are in great abundance, and well water is reached at an average depth of 30 feet. The Republican river, entering the county at the northwestern corner, flows east of south, and crosses the southern boundary eight miles east of the southwestern corner.

FARM AND CROP STATISTICS.—REPUBLIC COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	22,205	26,646	\$11,724 24	13,196	45,392	\$20,426 40
Spring wheat.....bu.	215	192	86 40	58	.....	.....
Corn.....bu.	164,261	1,806,871	542,061 30	147,764	443,292	190,615 56
Oats.....bu.	37,192	409,112	102,278 00	26,950	169,776	50,932 80
Rye.....bu.	2,859	17,154	6,518 52	1,741	19,151	8,617 95
Barley.....bu.	31	.....	.....	4	16	6 40
Buckwheat.....bu.	19	114	85 50	7	56	33 60
Irish potatoes.....bu.	1,637	29,466	26,519 40	1,123	12,343	8,886 96
Sweet potatoes.....bu.	11	440	440 00	2	90	90 00
Castor beans.....bu.	17	51	58 65	.....	.....	.....
Sorghum.....bu.	469	.....	15,427 00	832	.....	8,645 00
Cotton.....lbs.	.....	.....	.....	50	.....	.....
Flax.....bu.	66	264	224 00	26	78	78 00
Tobacco.....lbs.	4	.....	.....	9	2,700	276 00
Broom corn.....lbs.	907	453,500	13,605 00	888	177,600	4,440 00
Millet and hungarian.....tons	6,270	10,972	54,860 00	8,202	8,202	49,212 00
Milo maize.....tons	4	+	12 42	.....	.....	.....
Kafir corn.....tons	62	+	186 558 00	153	1,530	765 00
Jerusalem corn.....tons	4	+	6 18 00	29	203	101 50
Timothy.....tons	4,457	.....	.....	1,231	.....	.....
Clover.....tons	1,102	.....	.....	119	.....	.....
Blue grass.....tons	374	.....	.....	388	.....	.....
Alfalfa.....tons	1,603	* 7,459	44,754 00	1,737	† 6,106	36,636 00
Orchard grass.....tons	92	.....	.....	58	.....	.....
Other tame grasses.....tons	824	.....	.....	458	.....	.....
Prairie grass, fenced.....tons	56,446	15,426	100,269 00	50,858	5,598	27,990 00
Totals.....	301,131	.....	\$919,529 41	255,883	.....	\$407,747 11

Wheat on hand March 1, 1893, 60,683 bushels; March 1, 1894, 24,344 bushels.

Corn on hand March 1, 1893, 1,657,820 bushels; March 1, 1894, 660,634 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—REPUBLIC COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	301,131	\$919,529 41	255,883	\$407,747 11
Animals slaughtered and sold for slaughter.....	.....	892,209 00	.....	715,194 00
Milk sold.....	.....	1,548 00	.....	2,339 00
Poultry and eggs sold.....	.....	84,513 00	.....	85,332 00
Wool clip.....lbs.	92	14 72	75	9 75
Cheese.....lbs.	1,230	135 30	825	99 00
Butter.....lbs.	464,184	74,269 44	425,340	68,054 40
Garden products marketed.....	.....	2,821 00	.....	1,922 00
Horticultural products.....	.....	788 00	.....	262 00
Honey and beeswax.....lbs.	13,287	2,394 39	1,561	281 34
Wine manufactured.....gals.	389	389 00	50	50 00
Wood marketed.....	.....	648 00	.....	513 00
Totals.....	.....	\$1,979,259 26	.....	\$1,281,803 60

LIVE STOCK.—REPUBLIC COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	14,513	\$754,676 00	13,448	\$443,784 00
Mules and asses.....	1,133	70,246 00	1,145	48,090 00
Milch cows.....	9,583	191,660 00	8,077	177,694 00
Other cattle.....	20,616	350,472 00	14,362	258,516 00
Sheep.....	382	955 00	63	157 50
Swine.....	46,250	346,875 00	37,278	260,946 00
Totals.....	92,477	\$1,714,884 00	74,373	\$1,189,187 50

Number of dogs in county March 1, 1893, 2,542; March 1, 1894, 2,301.

RICE COUNTY.

Was organized in 1871. It lies in the geographical center of the state, has an area of 720 square miles, and ranks as the 44th county in population. Lyons, situated in the center, is the county seat. Sterling, in the south-central portion, is a thriving, growing place. Geneseo, Little River, Chase, Frederick and Raymond are places of considerable local importance.

Divisions of the Atchison, Topeka & Santa Fé, Missouri Pacific and the St. Louis & San Francisco railroads extend through nearly all portions of the county.

The western portion of the county is nearly level, while the central and eastern are moderately rolling. Bottom lands average from one to five miles in width, and cover 15 per cent. of the total county area. Timber belts occur along the streams, ranging from 50 feet to one-third of a mile in width, and contain cottonwood, elm,

POPULATION AND VALUATION.—RICE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	14,465	13,874	\$1,471,152	\$291,946	\$524,466	\$939,900	\$3,230,463
Lyons city.....	2,045	1,634	\$147,188	\$62,016	\$205,945	\$114,983	\$530,132
Atlanta twp.....	646 } 2,691	548 } 2,182	7,610	.....	1,431	.....	96,319
Center twp.....	545	488	73,245	10,835	43,749	.....	127,829
Eureka twp.....	595	537	74,392	8,309	6,566	41,200	130,467
Farmer twp.....	701	595	64,021	5,368	529	75,738	145,656
Galt twp.....	365	406	80,539	15,848	14,057	29,544	139,988
Lincoln twp.....	742	704	70,225	7,416	2,319	40,758	120,718
Mitchell twp.....	491	483	69,990	2,617	.....	27,974	100,581
Pioneer twp.....	551	513	110,020	13,370	7,965	88,879	220,224
Raymond twp.....	854	938	61,160	9,912	.....	.....	71,072
Rockville twp.....	418	439	161,306	79,162	239,367	141,729	621,564
Sterling city.....	2,029	1,865	.....	.....	.....	.....	.....
Sterling twp.....	809 } 2,838	834 } 2,699	28,361	15,859	51,339	.....	220,826
Little River city.....	404 } 1,191	401 } 1,247	54,581	9,372	5,769	66,810	136,522
Union twp.....	787	846	103,726	17,987	26,070	128,137	275,920
Valley twp.....	479	583	114,579	5,308	40	70,888	190,815
Geneseo city.....	304 } 953	305 } 965	73,635	8,455	.....	16,741	101,831
Victoria twp.....	649	660	.....	.....	.....	.....	.....
Washington twp.....	540	642	.....	.....	.....	.....	.....
Wilson twp.....	511	453	.....	.....	.....	.....	.....

hackberry, and oak. Springs are abundant in all portions of the county, and well water is found at an average depth of 25 feet. The Arkansas river flows in a south-eastern direction across the southwestern corner.

Limestone is found in the northeastern and southeastern portions, and sandstone near the town of Raymond, in the southwestern portion. Red ocher is found in the northeast. Salt has been discovered at Sterling, Little River, and Lyons. Plants at Sterling and Lyons are in operation.

FARM AND CROP STATISTICS.—RICE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	132,470	1,326,017	\$556,927 14	134,106	305,760	\$116,188 80
Spring wheat.....bu.	77,503	620,024	173,606 72	78,852	315,408	119,855 04
Corn.....bu.	17,447	174,470	45,362 20	13,103	19,650	5,698 50
Oats.....bu.	631	6,310	2,208 50	705	2,820	1,128 00
Rye.....bu.	55			45	315	141 75
Barley.....bu.	10	40	30 00			
Buckwheat.....bu.	908	54,480	51,211 20	690	10,340	9,306 00
Irish potatoes.....bu.	11	550	550 00	156	7,956	5,967 00
Sweet potatoes.....bu.				19	114	114 00
Castor beans.....bu.	479		6,940 00	1,071		6,381 00
Sorghum.....bu.	40	160	136 00			
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	5,833	1,749,900	52,497 00	4,382	1,314,600	46,011 00
Millet and hungarian, tons	2,885	2,885	14,425 00	2,630	2,630	13,150 00
Milo malze.....tons						
Kafir corn.....tons	58	† 174	609 00	1,320	19,800	9,900 00
Jerusalem corn.....tons						
Timothy.....tons	100			61		
Clover.....tons	37			15		
Blue grass.....tons	91	* 1,839	11,034 00	62	† 1,539	9,234 00
Alfalfa.....tons	1,354			1,716		
Orchard grass.....tons	10			5		
Other tame grasses.....tons	52					
Prairie grass, fenced.....tons	62,244	16,315	73,417 50	59,399	9,210	36,840 00
Totals.....	302,218		\$988,954 26	298,337		\$379,915 09

Wheat on hand March 1, 1893, 445,580 bushels; March 1, 1894, 227,522 bushels.

Corn on hand March 1, 1893, 787,397 bushels; March 1, 1894, 150,867 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—RICE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	302,218	\$988,954 26	298,337	\$379,915 09
Animals slaughtered and sold for slaughter.....		362,949 00		322,854 00
Milk sold.....		1,426 00		1,934 00
Poultry and eggs sold.....		45,687 00		48,597 00
Wool clip.....lbs.	3,134	501 44	5,035	654 55
Cheese.....lbs.	165	18 15	400	48 00
Butter.....lbs.	360,419	57,667 04	423,285	67,725 60
Garden products marketed.....		8,243 00		5,277 00
Horticultural products.....		2,215 00		3,228 00
Honey and beeswax.....lbs.	25	4 50		
Wine manufactured.....gals.	187	187 00	390	390 00
Wood marketed.....		71 00		682 00
Totals.....		\$1,467,923 39		\$831,305 24

LIVE STOCK.—RICE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	10,355	\$538,460 00	11,920	\$398,360 00
Mules and asses.....	1,192	73,904 00	1,385	58,170 00
Milch cows.....	6,829	136,580 00	6,716	147,752 00
Other cattle.....	14,516	246,772 00	11,009	198,162 00
Sheep.....	614	1,535 00	871	2,177 50
Swine.....	14,013	105,097 50	16,610	116,270 00
Totals.....	47,519	\$1,102,348 50	48,511	\$915,891 50

Number of dogs in county March 1, 1893, 1,723; March 1, 1894, 1,733.

Number of sheep killed by dogs, year ending March 1, 1894, 36.

RILEY COUNTY.

Ranks as the 49th county in population. It was one of the original counties, organized in 1855, prior to the admission of the state into the union. It has 617 square miles of territory. Manhattan, at the junction of the Blue and Kansas rivers, in the southeastern portion, is the county capital, also the seat of the state agricultural college. There are several other towns, such as Stockdale, Randolph, Leonardville, Riley, Bala, May Day, and Ogden, that do much business for the thrifty communities of which they are centers.

The railroads in the county are: The Union Pacific, the Omaha & Republican Valley, and the Kansas Central, members of the Union Pacific; Manhattan, Alma & Burlingame, of the Atchison, Topeka & Santa Fé; and the Chicago, Rock Island & Pacific.

Along the Kansas and Blue rivers, in the southern and eastern portions, high bluffs occur, while the western and northern sections are undulating. The bottoms along the rivers and creeks are in width from $1\frac{1}{2}$ to 2 miles, and, in the aggregate comprise 20 per cent. of the total area. Timber belts along the streams are from a

POPULATION AND VALUATION.—RILEY COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	12,369	11,967	\$1,848,149	\$459,028	\$500,675	\$716,642	\$3,524,494
Ashland twp.....	269	234	\$95,060	\$26,190	.....	.....	\$121,250
Bala twp.....	1,126	847	165,793	29,015	\$22,268	\$52,465	269,541
Center twp.....	437	444	72,055	18,560	.....	.....	90,615
Fancy Creek twp....	466	443	94,560	18,545	.....	14,526	127,631
Grant twp.....	465	446	88,350	15,600	2,125	37,900	143,975
Randolph city.....	348 }	394 }	.....	.....	.....	.....	.....
Jackson twp.....	522 }	522 }	102,865	41,555	30,078	32,047	206,545
Manhattan city.....	3,022 }	3,067 }	.....	.....	.....	.....	.....
Manhattan twp.....	930 }	982 }	242,125	132,194	409,860	189,036	973,215
May Day twp.....	573	529	74,925	18,290	.....	.....	93,215
Madison twp.....	1,232	987	228,295	49,475	17,507	61,155	356,432
Ogden twp.....	783	1,052	149,230	22,180	12,831	72,859	257,100
Sherman twp.....	422	560	84,430	18,350	.....	70,352	173,132
Swede Creek twp....	703	343	116,908	30,799	6,006	46,425	200,138
Wild Cat twp.....	548	616	134,473	16,335	.....	70,507	221,315
Zeandale twp.....	523	501	199,080	21,940	.....	69,370	290,390

few rods to one-half mile in width, the following varieties of native trees being found: Oak of several varieties, basswood, red and white elm, cottonwood, mulberry, ash, sycamore, box elder, walnut, honey locust, soft maple, red cedar, and willow. Springs are numerous in nearly every section, and well water is found at a depth of 26 feet on the bottoms, and at a greater depth on the uplands. The Kansas river, flowing in a northeastern direction, crosses the southeastern corner of the county.

A superior quality of magnesian limestone is found in all portions, and is quarried extensively, being used both at home and abroad. Large quantities of cement rock are found near Manhattan. Fire and potters' clay have been discovered on the banks of the Blue river, just north of Manhattan.

FARM AND CROP STATISTICS.—RILEY COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	15,792	104,225	\$45,859 00	9,118	99,568	\$43,809 92
Spring wheat.....bu.	34			2		
Corn.....bu.	67,111	1,744,886	471,119 22	66,931	267,724	107,089 60
Oats.....bu.	22,945	527,735	116,101 70	17,865	336,927	94,339 56
Rye.....bu.	701	7,711	2,544 63	280	3,640	1,456 00
Barley.....bu.	11					
Buckwheat.....bu.	19	114	85 50	41	328	196 80
Irish potatoes.....bu.	997	34,895	27,218 10	663	18,564	15,222 48
Sweet potatoes.....bu.	101	6,565	6,565 00	106	6,678	6,678 00
Castor beans.....bu.						
Sorghum.....bu.	310		3,616 00	374		2,465 00
Flax.....bu.	40	200	170 00	15	45	45 00
Tobacco.....lbs.						
Broom corn.....lbs.	238	119,000	3,570 00	210	105,000	3,150 00
Millet and hungarian, tons	2,837	5,674	22,696 00	3,760	7,520	45,120 00
Milo maize.....tons	1	3	11 00			
Kaffir corn.....tons	31	93	326 00	203	3,045	1,522 50
Jerusalem corn.....tons	2	3	9 00			
Timothy.....tons	781			249		
Clover.....tons	378			95		
Blue grass.....tons	435	* 3,348	20,088 00	321	† 3,208	19,248 00
Alfalfa.....tons	942			835		
Orchard grass.....tons	182			40		
Other tame grasses.....tons	84			268		
Prairie grass, fenced..tons	54,107	17,821	62,373 50	54,904	21,466	107,330 00
Totals.....	168,079		\$782,352 65	156,280		\$447,672 86

Wheat on hand March 1, 1893, 8,263 bushels; March 1, 1894, 58,704 bushels.

Corn on hand March 1, 1893, 342,590 bushels; March 1, 1894, 350,600 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—RILEY COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	168,079	\$782,352 65	156,280	\$447,672 86
Animals slaughtered and sold for slaughter.....		832,756 00		724,378 00
Milk sold.....		2,863 00		2,206 00
Poultry and eggs sold.....		37,520 00		38,408 00
Wool clip.....lbs.	2,790	446 40	120	15 60
Cheese.....lbs.	285	31 35	100	12 00
Butter.....lbs.	840,381	134,460 96	237,971	38,075 36
Garden products marketed.....		11,573 00		8,544 00
Horticultural products.....		1,730 00		8,326 00
Honey and beeswax.....lbs.	16,442	2,979 65	13,208	2,384 26
Winemanufactured.....gals.	1,628	1,628 00	1,026	1,026 00
Wood marketed.....		4,084 00		2,337 00
Totals.....		\$1,812,425 01		\$1,273,385 08

LIVE STOCK.—RILEY COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	9,109	\$473,668 00	8,232	\$271,656 00
Mules and asses.....	473	29,326 00	353	14,826 00
Milch cows.....	8,088	161,760 00	6,406	140,932 00
Other cattle.....	21,873	371,841 00	20,771	373,878 00
Sheep.....	447	1,117 50	406	1,015 00
Swine.....	23,143	173,572 50	26,104	182,728 00
Totals.....	63,133	\$1,211,285 00	62,272	\$935,035 00

Number of dogs in county March 1, 1893, 1,636; March 1, 1894, 1,324.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 2.

ROOKS COUNTY.

It was organized in 1872, has an area of 900 square miles, and ranks as the 69th county in population. The city of Stockton, on the north bank of the South Fork of the Solomon river, north and east of the center, is the county seat. Plainville, in the south-central portion of the county, is a place of local importance.

The Union Pacific, Lincoln & Colorado, a part of the Union Pacific system, crosses the southern portion of the county, and the Rooks County branch of the Missouri Pacific enters the northeastern portion, and terminates at the city of Stockton.

POPULATION AND VALUATION.—ROOKS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	7,144	7,179	\$1,478,669	\$176,159	\$229,606	\$252,991	\$2,137,245
Alcona twp.....	134	100	\$45,761	\$875			\$46,636
Ash Rock twp.....	360	358	70,288	5,129			75,417
Belmont twp.....	291	326	59,910	7,518	\$9,514		76,942
Bow Creek twp.....	187	199	47,978	3,500			51,478
Corning twp.....	247	280	60,055	5,290			65,345
Farmington twp.....	232	207	74,732	3,543			78,275
Greenfield twp.....	213	206	61,535	1,650			63,185
Hobart twp.....	159	157	69,335	1,585			70,920
Iowa twp.....	193	199	68,319	6,041	9,166	\$29,058	112,584
Lanark twp.....	237	231	61,123	4,666			65,789
Logan twp.....	387	405	57,743	5,253	932	31,441	95,369
Lowell twp.....	475	457	72,309	13,196	7,408	30,971	123,884
Medicine twp.....	277	281	55,763	6,265			62,018
Northampton twp...	351	380	51,078	5,525	3,213	42,255	102,071
Paradise twp.....	399	301	85,245	7,285	3,800	64,480	160,810
Plainville city.....	375 }	385 }					
Plainville twp.....	593 }	541 }	926	118,300	20,515	43,665	35,592
Richland twp.....	178	213	51,532	855	120	13,218	65,725
Rush twp.....	202	152	62,339	3,199			65,538
Stockton city.....	922 }	721 }	997	86,505	64,405	151,788	5,976
Stockton twp.....	108 }	276 }					
Sugar Loaf twp.....	160	157	56,645	1,294			57,939
Twin Mound twp....	208	338	58,214	3,235			61,449
Walton twp.....	256	309	103,970	5,335			109,305

High bluffs occur along the Solomon river and Paradise creek. Three-fifths of the general surface is an undulating prairie, one-fifth bluffy and rough, and one-fifth almost entirely level. The valley of the Solomon averages $1\frac{1}{2}$ miles in width, while those of other streams are from one-half to one mile wide. These, in the aggregate make up 12 per cent. of the county area. Timber belts along the streams are narrow, and not well defined. The principal varieties found on the South Fork of the Solomon are cottonwood, red and white elm, hackberry and ash; while those found on Paradise creek, the heaviest timbered stream in the county, are cottonwood, ash,

FARM AND CROP STATISTICS.—ROOKS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	78,726	47,232	\$21,726 72	81,969	221,316	\$99,592 20
Spring wheat.....bu.	485			88		
Corn.....bu.	46,270	925,400	231,350 00	44,284	177,136	74,397 12
Oats.....bu.	13,115	65,575	19,672 50	8,934	39,308	13,756 05
Rye.....bu.	4,474			1,964	13,748	6,186 60
Barley.....bu.	4,202			2,205	4,410	1,764 00
Buckwheat.....bu.	4	16	12 00	16	128	76 80
Irish potatoes.....bu.	584	37,969	22,776 00	684	37,620	33,853 00
Sweet potatoes.....bu.	8	600	600 00	6	390	468 00
Castor beans.....bu.						
Sorghum.....bu.	1,606		17,020 00	1,924		12,404 00
Flax.....bu.	3	12	10 20			
Tobacco.....lbs.						
Broom corn.....lbs.	85	42,500	1,700 00	20		
Millet and hungarian, tons	3,131	6,262	31,310 00	4,582	2,291	11,455 00
Milo maize.....tons	6	†	63 00	14	140	63 00
Kafir corn.....tons	209	836	2,926 00	1,019	10,190	5,095 00
Jerusalem corn.....tons	8	†	36 00	99	2,475	1,237 50
Timothy.....tons	13					
Clover.....tons	1			15		
Blue grass.....tons	6	*	3,194	5	†	3,873
Alfalfa.....tons	339		19,164 00	280		23,238 00
Orchard grass.....tons						
Other tame grasses.....tons	10			29		
Prairie grass, fenced.....tons	54,678	9,648	36,180 00	46,218	11,257	45,028 00
Totals.....	207,963		\$404,546 42	194,356		\$328,618 27

Wheat on hand March 1, 1893, 98,533 bushels; March 1, 1894, 24,528 bushels.

Corn on hand March 1, 1893, 346,766 bushels; March 1, 1894, 144,963 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—ROOKS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	207,963	\$404,546 42	194,356	\$328,618 27
Animals slaughtered and sold for slaughter.....		136,284 00		170,541 00
Milk sold.....		251 00		37 00
Poultry and eggs sold.....		25,270 00		28,828 00
Wool clip.....lbs.	12,398	1,983 68	5,368	697 84
Cheese.....lbs.	350	38 50	47	5 64
Butter.....lbs.	213,061	34,089 76	252,093	40,334 88
Garden products marketed.....		2,259 00		4,434 00
Horticultural products.....		60 00		225 00
Honey and beeswax.....lbs.			55	9 90
Wine manufactured.....gals.	132	132 00		
Wood marketed.....		45 00		454 00
Totals.....		\$604,959 36		\$574,185 53

red and white elm, black walnut, and oak. The South Fork of the Solomon river flows north of east through the county, a little north of the center.

Magnesian limestone of a very fine quality underlies the entire county. Quarries are in operation in the southeastern portion. This stone is very easily worked when first quarried, but hardens rapidly from exposure. A very hard, coarse, conglomerate sandstone is found in Sugar Loaf township, and is used mostly for foundations and the walling of wells. Gypsum is found in layers all over the county in considerable quantities. Fire and potters' clay are said to exist.

LIVE STOCK.—ROOKS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	6,622	\$344,344 00	7,035	\$232,155 00
Mules and asses	444	27,528 00	503	21,126 00
Milch cows	3,990	79,800 00	3,731	82,082 00
Other cattle	7,996	135,932 00	6,973	125,514 00
Sheep	1,146	2,865 00	756	1,890 00
Swine	6,353	47,647 50	8,226	57,582 00
Totals	26,551	\$638,116 50	27,224	\$520,349 00

Number of dogs in county March 1, 1893, 1,211; March 1, 1894, 1,199.

Number of sheep killed by dogs, year ending March 1, 1894, 5.

Number of sheep killed by wolves, year ending March 1, 1894, 4.

RUSH COUNTY.

It was organized in 1874, contains an area of 720 square miles, and ranks as the 74th county in point of population. La Crosse, situated in the exact center of the county, is the capital. Walnut City, four miles south of La Crosse, and McCracken, in the northwestern portion, are places of local importance.

POPULATION AND VALUATION.—RUSH COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

<i>Townships and cities.</i>	<i>Population.</i>		<i>Assessed valuation of property.</i>				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	5,487	5,150	\$1,228,343	\$95,588	\$92,311	\$332,160	\$1,748,402
Alexander twp.	218	234	\$67,526	\$2,901	\$259	\$27,154	\$97,840
Banner twp.	292	312	87,820	1,411	446	28,859	118,536
Belle Prairie twp.	206	196	89,706	1,758	877	29,932	122,273
Big Timber twp.	430	432	86,635	3,091	577	.....	90,303
Brookdale twp.	315	296	68,895	2,404	.....	34,974	106,273
Rush Centre city	204 } 320	161 } 289	87,279	6,000	9,224	31,045	133,548
Center twp.	116 }	128 }	242	79,882	2,098	.....	81,980
Fairview twp.	256	242	79,882	2,098	.....	.....	81,980
Garfield twp.	327	333	97,255	2,326	.....	28,189	127,770
McCracken city.	215 } 554	206 } 492	83,380	22,102	14,579	11,164	131,225
Hampton twp.	339 }	286 }	275	83,340	2,410	.....	85,750
Illinois twp.	269	275	83,340	2,410	.....	.....	85,750
La Crosse city.	466 } 687	390 } 570	80,647	30,242	63,205	37,568	211,662
La Crosse twp.	221 }	180 }	551	75,600	10,029	34,579	122,063
Lone Star twp.	549	551	75,600	10,029	1,555	40,255	123,820
Pioneer twp.	572	551	78,503	3,773	1,289	.....	82,955
Pleasantdale twp.	350	237	82,175	780	.....	.....	82,955
Union twp.	142	140	79,700	4,263	.....	28,441	112,404

The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé railroad, and the Kansas & Colorado, of the Missouri Pacific, cross the central portion of the county from east to west.

The general surface is an undulating prairie. Bottom lands average one mile in width, and contain 20 per cent. of the county area. There are very few springs in the county, and well water is obtained at an average depth of 25 feet. Walnut creek crosses the county from west to east, a little south of the center.

FARM AND CROP STATISTICS.—RUSH COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	99,154	15,864	\$7,138 80	105,664	50,718	\$20,287 20
Spring wheat.....bu.	1,118		121			
Corn.....bu.	19,090	76,360	25,198 80	14,163	14,163	5,665 20
Oats.....bu.	7,678		4,142	13,912		4,869 20
Rye.....bu.	3,100	12,400	4,712 00	2,323	6,969	2,787 60
Barley.....bu.	7,232		5,216	15,648		5,789 76
Buckwheat.....bu.						
Irish potatoes.....bu.	363	2,904	2,119 92	326	3,260	3,097 00
Sweet potatoes.....bu.				2	40	20 00
Castor beans.....bu.						
Sorghum.....bu.	4,464		24,996 00	5,194		27,525 00
Flax.....bu.	1	4	3 40	1		
Tobacco.....lbs.	12			3		
Broom corn.....lbs.	718	394,900	7,898 00	798	139,650	4,887 75
Millet and hungarian, tons	2,545	1,908	5,724 00	6,391	6,391	31,955 00
Milo maize.....tons	26	† 104	364 00	27	81	36 45
Kaffir corn.....tons	103	† 412	1,442 00	860	2,580	1,290 00
Jerusalem corn.....tons	51	† 102	306 00	511	2,555	1,277 50
Timothy.....tons	101					
Clover.....tons	1			1		
Blue grass.....tons		* 8,788	52,728 00		† 11,050	66,300 00
Alfalfa.....tons	89			109		
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	44,920	2,845	9,246 25	46,904	2,983	14,915 00
Totals.....	190,766		\$141,877 17	192,756		\$190,702 66

Wheat on hand March 1, 1893, 190,081 bushels; March 1, 1894, 30,456 bushels.

Corn on hand March 1, 1893, 33,613 bushels; March 1, 1894, 8,014 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—RUSH COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	190,766	\$141,877 17	192,656	\$190,702 66
Animals slaughtered and sold for slaughter.....		39,538 00		39,804 00
Milk sold.....		264 00		142 00
Poultry and eggs sold.....		20,286 00		20,176 00
Wool clip.....lbs.	446	71 36	6,781	875 03
Cheese.....lbs.	1,798	197 78	2,880	339 60
Butter.....lbs.	102,978	16,476 48	109,186	17,469 76
Garden products marketed.....		1,954 00		703 00
Horticultural products.....		9 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	7	7 00		
Wood marketed.....		70 00		21 00
Totals.....		\$220,750 79		\$270,233 05

Magnesian limestone of a very superior quality is found in all sections, and is used largely for building and making fence posts. The layers are from 6 to 12 inches in thickness, and are easily quarried. A shell-rock limestone is also found, and is used for fencing yards and corrals. Both fire and potters' clay are found near Rush Center. Gypsum exists in limited quantities.

LIVE STOCK.—RUSH COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	4,844	\$251,888 00	5,418	\$178,794 00
Mules and asses	369	22,878 00	335	14,070 00
Milch cows	2,562	51,240 00	2,468	54,296 00
Other cattle	4,734	80,478 00	3,852	69,336 00
Sheep	354	885 00	903	2,257 50
Swine	1,548	11,610 00	1,865	13,055 00
Totals	14,411	\$418,979 00	14,841	\$331,808 50

Number of dogs in county March 1, 1893, 867; March 1, 1894, 994.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

RUSSELL COUNTY.

Was organized in 1872, with a territory of 900 square miles, and now ranks as the 68th county in population in the state. It lies in the north-central portion, being in the third tier of counties south from the Nebraska state line. Russell, in the east-central portion, is the county seat. Bunker Hill, lying east and south of the center, is a place of considerable business.

The main line of the Union Pacific railroad crosses the county a little south of the center, and the Union Pacific, Lincoln & Colorado, a branch of the same, crosses the northeastern corner.

The general surface is rolling, with high bluffs on the Smoky Hill and Saline rivers and their tributaries. Bottoms on the streams average three-fourths of a mile in width, and comprise 20 per cent. of the total area. The streams are not continuously fringed with timber, a few groves appearing at intervals. The principal varieties of trees found are: Ash, black walnut, red and white elm, cottonwood, hackberry, oak, box-elder, and some cedar. The county is moderately well supplied with springs, and well water is reached at an average depth of 20 feet on the bottoms, and at much greater depths on the uplands. The Smoky Hill river crosses the southern portion of the county from west to east.

Soft and hard limestone crop out near the draws on the uplands, the soft layer first; the hard varies in thickness from 6 to 15 inches, the soft about five inches. A soft yellow limestone is also found on the uplands; it is found in squares, four to five inches thick, and two to four feet in length. A conglomerate stone is found that is used in making lime and building fences. Potters' clay is found on nearly all the large streams. Salt springs exist on the Saline river, in the northwestern portion, and on Paradise and Salt creeks.

POPULATION AND VALUATION.—RUSSELL COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	7,447	7,250	\$978,065	\$227,292	\$151,786	\$414,096	\$1,771,239
Gorham city.....	62	42					
Big Creek twp.....	492	514	\$88,435	\$9,287	\$3,576	\$51,410	\$152,708
Bunker Hill city.....	163	147					
Center twp.....	962	954	146,660	21,290	17,978	81,992	267,920
Fairfield twp.....	251	243	40,935	3,725			44,660
Waldo city.....	98	77					
Luray city.....	125	137					
Lucas city.....	150	192	231,990	53,295	28,992	102,270	416,547
Fairview twp.....	1,176	1,157					
Lincoln twp.....	749	770	121,890	11,836		19,070	152,796
Paradise twp.....	537	536	138,520	20,404	5,927	39,613	204,464
Dorrance city.....	207	207					
Plymouth twp.....	925	785	105,445	17,240	9,567	55,213	187,465
Russell city.....	1,064	1,022					
Russell twp.....	173	159	68,270	86,875	85,746	64,528	305,419
Winterset twp.....	308	308	35,920	3,340			39,260

FARM AND CROP STATISTICS.—RUSSELL COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	102,317	5,115	\$2,301 75	108,600	179,190	\$77,051 70
Spring wheat.....bu.	93					
Corn.....bu.	50,175	501,750	135,472 50	34,375	103,125	49,500 00
Oats.....bu.	5,733			2,833	3,392	1,153 28
Rye.....bu.	5,825			3,129	18,774	8,260 56
Barley.....bu.	2,486			1,253	6,265	2,443 35
Buckwheat.....bu.						
Irish potatoes.....bu.	501	9,018	7,665 30	578	23,120	18,958 40
Sweet potatoes.....bu.	2			3	186	167 40
Castor beans.....bu.						
Sorghum.....	4,644		26,072 00	5,237		28,785 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	350	175,000	5,250 00	571	285,500	9,992 50
Millet and hungarian.....tons	1,070	1,337	5,348 00	1,166	874	4,370 00
Milo maize.....tons	100	400	1,400 00	506	5,060	2,277 00
Kaffir corn.....tons	778	3,112	10,892 00	2,695	16,170	8,085 00
Jerusalem corn.....tons	31	47	141 00	33	198	99 00
Timothy.....tons						
Clover.....tons						
Blue grass.....tons		408	2,448 00		991	5,946 00
Alfalfa.....tona	289			324		
Orchard grass.....tons						
Other tame grasses.....tons	1					
Prairie grass, fenced.....tons	41,455	12,799	41,596 75	44,880	11,346	45,384 00
Totals.....	215,850		\$238,587 30	206,183		\$262,473 19

Wheat on hand March 1, 1893, 170,647 bushels; March 1, 1894, 31,760 bushels.

Corn on hand March 1, 1893, 171,946 bushels; March 1, 1894, 73,276 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—RUSSELL COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	215,850	\$238,587 30	206,183	\$262,473 19
Animals slaughtered and sold for slaughter.....		204,310 00		241,434 00
Milk sold.....		2,652 00		1,007 00
Poultry and eggs sold.....		30,990 00		27,723 00
Wool clip.....lbs.	6,206	992 96	20,800	2,704 00
Cheese.....lbs.	160	17 60		
Butter.....lbs.	186,131	29,780 96	204,115	32,658 40
Garden products marketed.....		1,179 00		409 00
Horticultural products.....		400 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	123	123 00		
Wood marketed.....		831 00		319 00
Totals.....		\$509,863 82		\$568,727 59

LIVE STOCK.—RUSSELL COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number	Value.	Number.	Value.
Horses.....	6,817	\$354,484 00	7,365	\$243,045 00
Mules and asses.....	450	27,900 00	479	20,118 00
Milch cows.....	4,229	84,580 00	4,079	89,738 00
Other cattle.....	14,291	242,947 00	11,184	201,312 00
Sheep.....	2,422	6,055 00	3,128	7,820 00
Swine.....	4,457	33,427 00	6,079	42,546 00
Totals.....	32,666	\$749,393 00	32,314	\$604,579 00

Number of dogs in county March 1, 1893, 1,308; March 1, 1894, 1,315.

Number of sheep killed by wolves, year ending March 1, 1894, 20.

SALINE COUNTY.

Organized in 1859, with a territory of 720 square miles, and now ranks as the 36th county in point of population in the state. The city of Salina, lying on the west bank of the Smoky Hill river, east and south of the center, is the county seat. It is one of the most important places in central Kansas. Brookville, in the west-central portion, Gypsum City in the southeastern, and Assaria and Bridgeport in the southern, do a large local trade.

The county is abundantly supplied with railroads, having branches of the Atchison, Topeka & Santa Fé, Union Pacific, Chicago, Rock Island & Pacific and Missouri Pacific systems extending in nearly all portions.

One-third of the surface is nearly level, one-third undulating, and the remainder high and broken. Bottoms vary in width from one to eight miles, the valleys of the Smoky Hill, Saline and Solomon rivers frequently attaining the latter width. Timber belts are from 40 rods to one mile in width; the following are the principal varieties of wood: Ash, elm, hackberry, mulberry, walnut, honey locust, oak, box elder, and cottonwood. Much attention is being given to the cultivation of forest trees, and many groves are met with on the upland farms. Springs are not plentiful, and well water is reached at depths varying from 30 to 60 feet. The Smoky

POPULATION AND VALUATION.—SALINE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	18,158	16,144	\$1,605,137	\$590,767	\$883,846	\$1,013,320	\$4,093,070
Cambria twp.....	648	611	\$109,220	\$14,780	\$5,654	\$68,925	\$198,579
Dayton twp.....	473	457	88,756	11,841	.....	147,520	248,117
Elm Creek twp.....	529	566	103,190	12,879	1,622	31,130	148,821
Eureka twp.....	420	437	91,640	12,999	307	55,630	160,476
Falun twp.....	541	585	56,680	3,270	2,258	48,020	110,228
Glendale twp.....	327	261	50,130	3,160	.....	.....	53,290
Greeley twp.....	572	555	112,695	12,745	.....	108,070	233,510
Gypsum city.....	630	613	74,560	26,636	.....	28,760	129,956
Gypsum twp.....	530	464	78,700	7,160	.....	32,240	118,100
Liberty twp.....	560	462	66,104	12,940	1,270	55,260	135,574
Ohio twp.....	507	462	58,500	3,090	.....	13,220	74,810
Pleasant Valley twp.....	430	406	154,246	381,444	810,275	182,695	1,628,660
Salina city.....	6,776	5,541	87,630	14,450	8,985	48,300	159,365
Smoky Hill twp.....	585	635	102,690	21,697	2,194	70,390	196,971
Assaria city.....	196	205	90,741	9,390	.....	12,500	112,631
Smoky View twp.....	970	906	109,255	16,960	.....	71,410	197,625
Smolan twp.....	763	706	37,990	1,350	21,070	.....	60,410
Solomon twp.....	487	502	77,120	14,136	.....	.....	91,256
Brookville city.....	400	629	55,390	9,840	30,211	39,250	134,691
Spring Creek twp.....	680	1,080	.....	.....	.....	.....	.....
Summit twp.....	173	180	.....	.....	.....	.....	.....
Walnut twp.....	512	525	.....	.....	.....	.....	.....
Washington twp.....	449	436	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—SALINE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	109,448	700,464	\$315,208 80	108,831	1,123,128	\$438,019 92
Spring wheat.....bu.	45	.....	.....	44	.....	.....
Corn.....bu.	44,942	449,420	134,826 00	49,256	49,256	18,717 28
Oats.....bu.	15,289	229,335	59,627 10	13,683	52,536	18,387 60
Rye.....bu.	3,093	55,674	21,156 12	2,523	32,799	11,151 66
Barley.....bu.	54	.....	.....	29	116	46 40
Buckwheat.....bu.	6	30	22 50	10	80	48 00
Irish potatoes.....bu.	870	46,110	39,193 50	868	8,680	6,249 60
Sweet potatoes.....bu.	29	1,450	1,450 00	30	300	225 00
Castor beans.....bu.	10	50	67 50	.....	.....	.....
Sorghum.....bu.	2,016	.....	17,322 00	3,423	.....	36,780 00
Flax.....bu.	.....	.....	.....	5	15	15 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	85	42,500	1,062 50	363	.....	.....
Millet and hungarian, tons	672	672	2,688 00	709	1,063	5,315 00
Milo maize.....tons	18	†	252 00	33	165	74 25
Kafir corn.....tons	132	†	1,848 00	519	2,595	1,297 50
Jerusalem corn.....tons	5	†	30 00	10	50	25 00
Timothy.....tons	215	.....	.....	421	.....	.....
Clover.....tons	23	.....	.....	42	.....	.....
Blue grass.....tons	507	* 3,205	19,230 00	3,957	† 4,313	25,878 00
Alfalfa.....tons	3,252	.....	.....	53	.....	.....
Orchard grass.....tons	65	.....	.....	70	.....	.....
Other tame grasses.....tons	30	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	49,182	16,057	52,185 25	60,083	18,776	93,880 00
Totals.....	229,989	.....	\$666,159 27	245,600	.....	\$656,110 21

Wheat on hand March 1, 1893, 563,894 bushels; March 1, 1894, 232,848 bushels.

Corn on hand March 1, 1893, 329,919 bushels; March 1, 1894, 112,444 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

Hill river enters the county on the southern border, a little east of the center, flows north for a distance of 18 miles to the city of Salina, then turns to the north of east, and leaves the county on the eastern line five miles south of the northeastern corner.

A fine quality of limestone is found on the Smoky Hill river, southeast of the city of Salina. A good quality of sandstone is quarried in the southern portion, in Smoky View and Liberty townships. Fire clay is found in the extreme western part, and extensive beds of gypsum are found along Gypsum creek.

Salt wells exist in the northeastern corner of the county, along the Solomon river, from which large quantities of salt have been manufactured.

SUMMARY.—SALINE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	229,989	\$666,159 27	245,600	\$656,110 21
Animals slaughtered and sold for slaughter.....		372,507 00		360,507 00
Milk sold.....		7,108 00		2,147 00
Poultry and eggs sold.....		43,814 00		44,738 00
Wool clip.....lbs.	10,020	1,603 20	8,460	1,099 80
Cheese.....lbs.	8,552	940 72	4,622	554 64
Butter.....lbs.	326,361	52,057 76	359,964	57,594 24
Garden products marketed.....		5,336 00		6,265 00
Horticultural products.....		8,205 00		3,223 00
Honey and beeswax.....lbs.	3,791	684 62	7,366	1,326 76
Wine manufactured.....gals.	1,739	1,739 00	1,408	1,408 00
Wood marketed.....		631 00		1,203 00
Totals.....		\$1,160,785 57		\$1,136,176 65

LIVE STOCK.—SALINE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	9,932	\$516,464 00	10,342	\$341,286 00
Mules and asses.....	747	46,314 00	670	28,140 00
Milch cows.....	6,092	121,840 00	5,834	128,348 00
Other cattle.....	17,540	298,180 00	14,572	262,296 00
Sheep.....	1,512	3,780 00	957	2,392 50
Swine.....	143	1,072 50	12,395	86,772 00
Totals.....	35,966	\$987,650 50	44,771	\$849,234 50

Number of dogs in county March 1, 1893, 1,364; March 1, 1894, 1,554.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

SCOTT COUNTY.

It was organized in 1886, with an area of 720 square miles. It is the 99th in point of population. Scott City, situated in the center, is the county seat.

The Chicago, Kansas & Western division of the Atchison, Topeka & Santa Fé railroad, and Denver, Memphis & Atlantic, of the Missouri Pacific, cross the central portion of the county from east to west.

The general surface is an undulating prairie, sand hills occurring in the extreme southeastern portion. There are but few water courses in the county, Ladder creek

being the most prominent. There are several basins or depressions, one of very large extent in the central portion, and one in the southeastern, known as Dry Lake, which have streams running into them during wet seasons.

Magnesian limestone is found in the northern and southwestern portions. Sandstone of an inferior quality crops out in places. Gypsum is found in some localities, at depths varying from 15 to 40 feet. Cement rock has been discovered in the northern portion of the county.

POPULATION AND VALUATION.—SCOTT COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad. *	Total.
The county.....	1,142	1,163	\$661,329	\$34,793	\$58,266	\$259,021	\$1,013,409
Beaver twp.....	154	148	\$100,236	\$1,430	\$4,264		\$105,930
Isabel twp.....	88	118	84,140	1,243	624		86,007
Keystone twp.....	200	223	79,425	1,760	1,081		82,266
Lake twp.....	110	105	93,410	1,210			94,620
Michigan twp.....	112	91	100,728	1,169	3,208		105,105
Scott twp.....	346	333	104,140	11,212	48,853		164,205
Valley twp.....	132	145	99,250	1,751	236		101,237
Judgments.....				*15,018			15,018
Railroad.....						\$259,021	259,021

*Not distributed.

FARM AND CROP STATISTICS.—SCOTT COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	15,002			21,889	44,652	\$17,860 86
Spring wheat.....bu.	643			354	530	196 11
Corn.....bu.	615			908		
Oats.....bu.	3,329			2,869	13,770	5,094 96
Rye.....bu.	977			436	872	279 04
Barley.....bu.	3,839			2,908	11,632	4,071 20
Buckwheat.....bu.						
Irish potatoes.....bu.	87			67	670	603 00
Sweet potatoes.....bu.				1	10	9 00
Castor beans.....bu.						
Sorghum.....bu.	2,748		\$19,228 00	3,590		21,899 00
Flax.....bu.	74	222	188 70			
Tobacco.....lbs.				3		
Broom corn.....lbs.	120	48,000	1,200 00	65		
Millet and hungarian.....tons	205	102	306 00	572	1,144	5,720 00
Milo maize.....tons	128	320	1,120 00	43	516	232 20
Kaffir corn.....tons	117	234	819 00	240	4,320	2,160 00
Jerusalem corn.....tons	601	601	1,863 00	762	15,240	7,620 00
Timothy.....tons						
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	29	* 52	312 00	41	† 58	348 00
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	5,514	1,110	5,550 00	4,796	768	3,072 00
Totals.....	34,028		\$30,526 70	39,544		\$69,165 24

Wheat on hand March 1, 1893, 8,751 bushels.

Corn on hand March 1, 1893, 432 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—SCOTT COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	34,028	\$30,526 70	39,544	\$69,165 24
Animals slaughtered and sold for slaughter.....		22,526 00		13,909 00
Milk sold.....		233 00		16 00
Poultry and eggs sold.....		1,952 00		1,587 00
Wool clip.....lbs.	26,824	4,291 84	34,394	4,471 22
Cheese.....lbs.	4,020	442 20	3,000	360 00
Butter.....lbs.	25,495	4,079 20	23,181	3,708 96
Garden products marketed.....		497 00		231 00
Horticultural products.....		4,544 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	5	5 00		
Wood marketed.....				
Totals.....		\$69,096 94		\$93,443 42

LIVE STOCK.—SCOTT COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,490	\$77,480 00	1,557	\$51,381 00
Mules and asses.....	88	5,456 00	83	3,486 00
Milch cows.....	843	16,860 00	638	14,036 00
Other cattle.....	1,773	30,141 00	941	16,938 00
Sheep.....	5,364	13,410 00	3,629	9,072 50
Swine.....	393	2,985 00	345	2,415 00
Totals.....	9,956	\$146,332 00	7,193	\$97,328 50

Number of dogs in county March 1, 1893, 129; March 1, 1894, 170.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

SEDGWICK COUNTY.

Was organized in 1870, with an area of 1,008 square miles, and ranks as the third county in population. Wichita, lying on the east bank of the Arkansas river, in the east-central portion, is the county seat. It is the distributing point for supplies to the Indian Territory and southwestern Kansas, and is the foremost commercial city in the southern part of the state. Clear Water, Valley Centre, Cheney and Colwich are thriving places.

The railroad facilities of this county are unusually good. Divisions of the Atchison, Topeka & Santa Fé, Missouri Pacific, St. Louis & San Francisco and Chicago, Rock Island & Pacific systems, and Wichita & Western, operated by the Atchison, Topeka & Santa Fé, extend into all portions. Of the 28 municipal townships, there are but two that have not a line of road passing through some part of them.

The general surface is a gently rolling prairie, having the appearance of being almost a level plain. Fifty per cent. of the total area is in bottom land, the valleys averaging a width of seven miles, and frequently, on the Arkansas river, spread out to a width of 10 and 12 miles. Timber belts along the streams average $1\frac{1}{2}$ miles in width; the following are the principal varieties of trees: Walnut, hackberry, elm, box elder, and cottonwood. Springs are not numerous, and well water is found at depths varying from 10 to 50 feet. The Arkansas river enters the county at the northwestern corner, and, flowing southeast, crosses the southern boundary six miles west of the southeastern corner.

Limestone is found in the eastern and western portions, as well as in the southwestern, the best quarries being found in Morton and Erie townships. The county is not abundantly supplied with building stone, but the famous Cowley county quarries are within easy reach by railroad. Fire and potters' clay are found in great abundance within six miles of Wichita, and large quantities of brick and pottery are manufactured at that point. Gypsum beds of large extent exist southeast of Wichita, the veins being eight feet in thickness.

POPULATION AND VALUATION.—SEDGWICK COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	40,177	39,043	\$3,944,961	\$1,243,661	\$4,445,146	\$1,386,420	\$11,020,188
Afton twp.....	503	438	\$110,235	\$6,565	.....	.....	\$116,800
Goddard city.....	229 } 830	585	146,350	17,090	\$7,676	\$28,485	199,601
Attica twp.....	601 }	602	174,661	16,865	37,727	53,435	282,688
Delano twp.....	664	588	132,933	14,857	2,421	47,230	197,441
Eagle twp.....	625	299	94,440	8,410	695	27,390	130,935
Erie twp.....	332	703	122,121	11,045	7,885	27,685	168,736
Garden Plain twp.....	679	374	82,947	2,044	.....	815	85,806
Grand River twp.....	405	700	142,920	8,441	1,129	2,325	154,815
Grant twp.....	674	850	145,582	18,086	16,921	25,520	206,109
Mount Hope city.....	341 } 954	273 }	145,582	18,086	16,921	25,520	206,109
Greeley twp.....	613 }	577 }	145,582	18,086	16,921	25,520	206,109
Gypsum twp.....	643	597	225,432	12,830	2,680	56,835	297,777
Illinois twp.....	451	443	124,676	10,480	.....	.....	135,156
Kechi twp.....	795	795	182,158	13,760	7,445	164,210	367,573
Lincoln twp.....	357	552	130,460	12,505	1,987	43,610	188,562
Minneha twp.....	519	514	147,026	6,765	925	45,605	200,321
Cheney city.....	303 } 621	254 }	104,955	22,420	21,009	30,340	178,724
Morton twp.....	318 }	363 }	104,955	22,420	21,009	30,340	178,724
Clear Water city.....	338 }	237 }	104,955	22,420	21,009	30,340	178,724
Ninnesch twp.....	523 }	469 }	104,955	22,420	21,009	30,340	178,724
Ohio twp.....	481	481	126,183	10,995	3,195	53,785	194,158
Park twp.....	803	646	133,288	7,915	3,175	23,140	167,518
Payne twp.....	661	615	128,232	7,621	2,162	46,330	184,345
Mulvane city.....	260 } 1,045	250 }	139,540	16,135	18,794	90,605	265,074
Rockford twp.....	785 }	791 }	139,540	16,135	18,794	90,605	265,074
Salem twp.....	686	719	146,707	17,825	355	38,890	203,777
Sherman twp.....	821	771	152,098	6,000	10,116	26,775	194,989
Colwich city.....	192 } 862	193 }	152,098	6,000	10,116	26,775	194,989
Union twp.....	670 }	585 }	152,098	6,000	10,116	26,775	194,989
Valley Centre city.....	345 }	313 }	152,098	6,000	10,116	26,775	194,989
Valley Centre twp.....	605 }	584 }	152,098	6,000	10,116	26,775	194,989
Waco twp.....	421	491	115,296	12,185	1,940	28,590	158,011
Wichita twp.....	936	964	269,765	23,785	7,570	60,860	361,980
Wichita city.....	21,916 } 22,598	21,619 }	244,643	921,685	4,233,870	273,540	5,673,738
Wichita twp.....	682 }	658 }	244,643	921,685	4,233,870	273,540	5,673,738

FARM AND CROP STATISTICS.—SEDGWICK COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	132,394	868,504	\$390,826 80	120,824	833,680	\$316,798 40
Spring wheat.....bu.	54			50	49	18 13
Corn.....bu.	118,996	1,189,960	333,188 80	138,652	1,247,868	474,189 84
Oats.....bu.	54,980	879,680	219,920 00	55,990	436,710	139,747 20
Rye.....bu.	692	6,228	3,114 00	584	5,256	1,997 28
Barley.....bu.	36			50	200	80 00
Buckwheat.....bu.	25	150	112 50	7	56	33 60
Irish potatoes.....bu.	1,125	33,750	27,000 00	1,195	17,925	13,443 75
Sweet potatoes.....bu.	156	9,360	9,360 00	553	16,590	8,295 00
Castor beans.....bu.	19	57	65 55			
Sorghum.....bu.	651		11,708 00	994		6,455 00
Flax.....bu.				1	6	6 00
Tobacco.....lbs.						
Broom corn.....lbs.	49	24,500	735 00	44		
Millet and hungarian, tons	2,162	2,162	8,648 00	2,971	1,486	7,430 00
Milo maize.....tons	21	†	221 00	35	700	315 00
Kaffir corn.....tons	94	282	987 00	221	2,210	1,105 00
Jerusalem corn.....tons	3	†	18 00	2	50	25 00
Timothy.....tons	556			368		
Clover.....tons	195			47		
Blue grass.....tons	182			346		
Alfalfa.....tons	1,850	* 2,262	13,572 00	2,563	* 1,607	9,642 00
Orchard grass.....tons	136			193		
Other tame grasses.....tons	284			69		
Prairie grass, fenced..tons	105,070	40,969	204,845 00	107,449	21,883	65,649 00
Totals.....	419,730		\$1,224,321 65	433,208		\$1,045,230 20

Wheat on hand March 1, 1893, 350,784 bushels; March 1, 1894, 211,631 bushels.

Corn on hand March 1, 1893, 826,203 bushels; March 1, 1894, 186,842 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—SEDGWICK COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	419,730	\$1,224,321 65	433,208	\$1,045,230 20
Animals slaughtered and sold for slaughter.....		825,109 00		793,845 00
Milk sold.....		26,140 00		31,691 00
Poultry and eggs sold.....		63,392 00		65,240 00
Wool clip.....lbs.	42,136	6,741 76	44,493	5,784 00
Cheese.....lbs.	956	105 16	495	59 40
Butter.....lbs.	540,819	86,531 04	626,267	100,202 72
Garden products marketed.....		28,536 00		27,714 00
Horticultural products.....		13,461 00		13,258 00
Honey and beeswax.....lbs.	6,199	1,126 88	1,315	236 70
Wine manufactured.....gals.	10,921	10,921 00	8,929	8,929 00
Wood marketed.....		317 00		1,200 00
Totals.....		\$2,286,702 49		\$2,093,390 02

LIVE STOCK.—SEDGWICK COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	16,223	\$843,596 00	16,729	\$552,057 00
Mules and asses.....	1,561	96,782 00	1,485	62,370 00
Milch cows.....	10,730	214,600 00	10,499	221,078 00
Other cattle.....	27,664	470,288 00	20,041	360,738 00
Sheep.....	8,185	20,462 50	4,911	12,277 50
Swine.....	38,484	288,630 00	37,205	260,435 00
Totals.....	102,847	\$1,934,358 50	90,420	\$1,468,955 50

Number of dogs in county, March 1, 1893, 2,789; March 1, 1894, 2,764.

Number of sheep killed by dogs, year ending March 1, 1894, 3.

Number of sheep killed by wolves, year ending March 1, 1894, 10.

SEWARD COUNTY.

Organized in June, 1886; has a territory of 648 square miles, and ranks as the 101st in population. Springfield, situated north and west of the center, is the county seat.

The Chicago, Rock Island & Pacific railroad enters the county on the east, about 11 miles south of the northern line, crosses the southeastern portion, and leaves the southern border four miles from the western boundary.

POPULATION AND VALUATION.—SEWARD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad. *	Total.
The county.....	1,000	826	\$5,535,920	\$39,014	\$22,019	\$160,536	\$775,161
Cimarron twp.....	67	65	\$56,497	\$7,000	.....	.....	\$63,497
Fargo twp.....	201	175	95,874	20,580	\$1,643	.....	118,097
Garfield twp.....	47	15	78,565	427	722	.....	79,714
Liberal city.....	224	381	118,266	9,364	13,844	.....	141,474
Liberal twp.....	157	.....	.....	.....	.....	.....	.....
Seward twp.....	112	84	116,200	743	.....	.....	116,943
Springfield twp.....	192	136	88,190	900	5,810	.....	94,900
Railroad.....	.....	.....	.....	.....	.....	\$160,536	160,536

*Not distributed.

FARM AND CROP STATISTICS.—SEWARD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	6,865	1,372	\$548 80	6,300	10,710	\$4,284 00
Spring wheat.....bu.	70	.....	.....	.....	.....	.....
Corn.....bu.	3,116	9,348	4,674 00	885	.....	.....
Oats.....bu.	1,067	.....	.....	382	3,430	1,269 10
Rye.....bu.	1,017	.....	.....	239	478	224 66
Barley.....bu.	1,454	5,816	2,326 40	412	4,532	2,130 04
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	28	.....	.....	11	55	55 00
Sweet potatoes.....bu.	7	280	280 00	3	120	150 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....	1,290	.....	8,892 00	1,402	.....	8,110 00
Cotton.....lbs.	.....	.....	.....	5	1,000	60 00
Flax.....bu.	2	8	6 80	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	4,555	911,000	18,220 00	1,947	146,025	3,650 63
Millet and hungarian, tons	364	182	546 00	142	71	355 00
Milo maize.....tons	472	1,416	4,956 00	228	1,140	513 00
Kaffir corn.....tons	489	978	3,423 00	1,061	10,610	5,305 00
Jerusalem corn.....tons	144	216	648 00	189	945	472 50
Timothy.....tons	1	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	1	.....	.....	.....	.....	.....
Alfalfa.....tons	30	334	2,004 00	26	195	1,170 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	4,243	3,617	10,851 00	5,840	2,983	8,949 00
Totals.....	25,215	.....	\$57,376 00	19,072	.....	\$36,697 93

Wheat on hand March 1, 1893, 6,375 bushels; March 1, 1894, 1,007 bushels.

Corn on hand March 1, 1893, 1,315 bushels; March 1, 1894, 193 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface is undulating, there being but few hills and bluffs. The soil is light and sandy, and in some places is heaped into small hills. The Cimarron river enters the county near the northwestern corner, and flows southeast, leaving the county near its southeastern corner. An occasional tree is found along the banks of the river, the county being practically without timber. In the southeastern portion, limestone of fair quality is found.

SUMMARY.—SEWARD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	25,215	\$57,376 00	19,072	\$36,697 93
Animals slaughtered and sold for slaughter.....		18,585 00		20,007 00
Milk sold.....		34 00		92 00
Poultry and eggs sold.....		1,560 00		791 00
Wool clip.....lbs.				
Cheese.....lbs.				
Butter.....lbs.	17,696	2,831 36	13,246	2,119 36
Garden products marketed.....		673 00		740 00
Horticultural products.....				
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$81,159 36		\$60,447 29

LIVE STOCK.—SEWARD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	623	\$32,396 00	579	\$19,107 00
Mules and asses.....	73	4,526 00	51	2,142 00
Milch cows.....	707	14,140 00	327	7,194 00
Other cattle.....	3,787	64,379 00	2,788	50,184 00
Sheep.....				
Swine.....	387	2,902 50	394	2,758 00
Totals.....	5,577	\$118,343 50	4,139	\$81,385 00

Number of dogs in county March 1, 1893, 134; March 1, 1894, 78.

SHAWNEE COUNTY.

Was organized in 1855, while Kansas was yet a territory. It ranks as the second county in the state in population, and has an area of 558 square miles. The city of Topeka, on the Kansas river, in the central portion, is the county seat as well as the capital of the state, and is one of the commercial centers of the state. In addition to the capitol, the buildings belonging to the state and located near the city are the state reform school, about two miles north from the city, and one of the insane asylums a short distance west from the capitol building. The government has erected at this point a fine cut-stone building for the use of the post office, United States courts, etc. Rossville and Silver Lake, in the northwestern portion, are places of much importance to the surrounding country. The towns of Auburn and Rich-

land, in the southern and southeastern portions of the county, and Tecumseh, four miles east of Topeka, are also of considerable importance to their localities.

The railroads in the county are: The Atchison, Topeka & Santa Fé; the Kansas Nebraska & Dakota, of the Missouri Pacific system, crossing the eastern portion, north and south; the Union Pacific, crossing the northern portion east and west; and the Chicago, Rock Island & Pacific, in the same direction, a little north of the center.

POPULATION AND VALUATION.—SHAWNEE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	47,219	45,125	\$3,956,485	\$2,397,410	\$8,664,785	\$1,290,909	\$16,309,589
Auburn twp.....	879	682	\$185,130	\$48,500	\$8,540	.....	\$242,170
Dover twp.....	1,025	975	215,780	62,620	10,065	\$55,680	344,145
Menoken twp.....	794	834	288,845	65,050	.....	49,706	403,601
Mission twp.....	1,019	842	296,120	84,475	45,730	52,239	478,564
Monmouth twp.....	1,169	1,238	238,950	52,165	6,820	44,402	342,337
Rossville city.....	454	496	.....	.....	.....	.....	.....
Rossville twp.....	977	1,012	292,155	106,455	30,830	82,190	511,630
Silver Lake city.....	.....	299	.....	.....	.....	.....	.....
Silver Lake twp.....	755	543	305,500	38,780	29,095	56,648	430,123
Soldier twp.....	2,340	1,089	549,460	71,470	67,680	235,421	924,031
Tecumseh twp.....	919	814	275,620	29,900	4,795	98,008	408,323
Topeka city.....	31,422	30,724	1,122,405	1,768,395	8,457,720	525,594	11,874,114
Topeka twp.....	4,758	4,914	186,420	69,600	3,510	91,021	350,551
Williamsport twp.....	708	663	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—SHAWNEE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	12,343	96,265	\$46,207 20	6,523	96,016	\$40,326 72
Spring wheat.....bu.	8	.....	.....	.....	.....	.....
Corn.....bu.	92,892	2,879,652	777,506 04	89,784	1,885,464	678,767 04
Oats.....bu.	12,317	246,340	56,658 20	9,470	160,402	44,912 56
Rye.....bu.	543	8,145	4,072 50	243	3,402	1,360 80
Barley.....bu.	.....	.....	.....	25	250	100 00
Buckwheat.....bu.	22	220	165 00	1	8	4 80
Irish potatoes.....bu.	1,970	165,480	91,014 00	3,994	203,694	91,662 30
Sweet potatoes.....bu.	301	33,110	33,110 00	440	17,600	7,040 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	739	.....	20,088 00	585	.....	4,027 00
Flax.....bu.	32	256	217 60	3	27	27 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	124	62,000	1,860 00	58	.....	.....
Millet and hungarian.....tons	3,563	8,907	35,628 00	3,882	6,792	27,168 00
Milo maize.....tons	14	56	156 00	.....	.....	.....
Kafir corn.....tons	28	112	392 00	57	1,140	570 00
Jerusalem corn.....tons	.....	.....	.....	.....	.....	.....
Timothy.....tons	11,086	.....	.....	9,917	.....	.....
Clover.....tons	2,233	.....	.....	2,516	.....	.....
Blue grass.....tons	1,876	* 7,282	43,692 00	1,737	† 7,118	42,708 00
Alfalfa.....tons	118	.....	.....	97	.....	.....
Orchard grass.....tons	106	.....	.....	78	.....	.....
Other tame grasses.....tons	1,613	.....	.....	800	.....	.....
Prairie grass, fenced.....tons	86,945	30,972	108,402 00	69,138	38,560	192,800 00
Totals.....	228,873	.....	\$1,219,208 54	199,348	.....	\$1,131,474 22

Wheat on hand March 1, 1893, 36,330 bushels; March 1, 1894, 34,210 bushels.

Corn on hand March 1, 1893, 790,422 bushels; March 1, 1894, 825,320 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface of the county is a rolling prairie, with a few high hills and bluffs. The bottom lands of the Kansas and Wakarusa rivers are from one to three miles in width, and these, together with the valleys of the creeks, comprise 31 per cent. of the county area. Timber belts on the streams average a width of three-fourths of a mile, and contain oak, ash, walnut, hickory, hackberry, basswood, elm, cottonwood, mulberry, box elder, redbud, and ironwood. Springs are abundant, and well water is reached at depths varying from 10 to 40 feet. The Kansas river, flowing a little south of east, crosses the county a little north of the center.

Both blue and gray limestone are found in abundance in the bluffs and along the banks of creeks and draws. Fire clay is found under coal veins, and clay suitable for brickmaking is found in many places. At Topeka, great quantities of brick are manufactured for building purposes. Three miles west of the city a large plant for the manufacture of vitrified brick is established. This brick is now being extensively used for sidewalks and the paving of streets.

SUMMARY.—SHAWNEE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	228,873	\$1,219,208 54	199,348	\$1,131,474 22
Animals slaughtered and sold for slaughter.....		575,749 00		508,412 00
Milk sold.....		24,359 00		26,712 00
Poultry and eggs sold.....		37,501 00		38,731 00
Wool clip.....lbs.	30	4 80	960	124 80
Cheese.....lbs.	80	8 80	30	3 60
Butter.....lbs.	500,679	80,108 64	542,941	86,870 56
Garden products marketed.....		54,230 00		47,934 00
Horticultural products.....		9,246 00		12,382 00
Honey and beeswax.....lbs.	2,728	511 83	5,206	937 38
Wine manufactured.....gals.	669	669 00	2,609	2,609 00
Wood marketed.....		1,475 00		990 00
Totals.....		\$2,003,071 61		\$1,857,180 56

LIVE STOCK.—SHAWNEE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	14,794	\$769,288 00	13,858	\$457,314 00
Mules and asses.....	895	55,490 00	1,005	42,210 00
Milch cows.....	9,369	187,380 00	8,110	178,420 00
Other cattle.....	16,271	276,607 00	16,193	291,474 00
Sheep.....	200	500 00	4,120	10,300 00
Swine.....	18,790	140,925 00	22,965	160,965 00
Totals.....	60,319	\$1,430,190 00	66,281	\$1,140,683 00

Number of dogs in county March 1, 1893, 3,181; March 1, 1894, 1,948.

Number of sheep killed by dogs, year ending March 1, 1894, 4.

SHERIDAN COUNTY.

Organized in 1880; has a territory of 900 square miles; ranks as the 83d county in population. Hoxie, situated in the exact center, is the county seat.

The Union Pacific, Lincoln & Colorado railroad, a member of the Union Pacific,

POPULATION AND VALUATION.—SHERIDAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	3,370	3,241	\$891,730	\$81,002	\$37,001	\$250,837	\$1,260,570
Adell twp.	412	316	\$55,940	\$4,738			\$60,678
Bloomfield twp.	163	141	34,410	1,184		\$1,958	37,552
Bow Creek twp.	266	249	71,950	8,001			79,951
Hoxie city	233 } 342	227 } 350	37,780	24,654	\$28,514	33,192	124,140
Kenneth twp.	109 }	123 }					
Logan twp.	294	262	70,740	2,441	354	62,123	135,658
Parnell twp.	241	288	68,880	4,778			73,658
Prairie Dog twp.	194	204	35,960	3,290		45,741	84,991
Saline twp.	271	318	141,140	6,376			147,516
Sheridan twp.	438	334	50,340	3,993	7,368	42,890	104,591
Solomon twp.	320	300	113,560	6,250			119,810
Spring Brook twp.	211	134	110,870	7,556			118,426
Union twp.		171	34,590	3,327			37,917
Valley twp.	218	174	65,570	4,414	765	64,933	135,682

FARM AND CROP STATISTICS.—SHERIDAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	31,715			32,351	2,910	\$1,309 50
Spring wheat.....bu.	5,677			3,648	327	147 15
Corn.....bu.	8,562	59,934	\$19,178 88	24,761		
Oats.....bu.	4,278			2,912		
Rye.....bu.	3,074			1,564	4,692	2,346 00
Barley.....bu.	5,019	50,190	17,566 50	2,784		
Buckwheat.....bu.	3	12	9 00	14	112	67 20
Irish potatoes.....bu.	403	14,105	10,578 75	370	3,700	3,330 00
Sweet potatoes.....bu.	2					
Castor beans.....bu.						
Sorghum.....bu.	1,545		21,308 00	1,543		12,797 00
Flax.....bu.				43	86	86 00
Tobacco.....lbs.						
Broom corn.....lbs.	4,681	1,404,300	35,107 50	4,088		
Millet and hungarian, tons	1,980	1,485	7,425 00	2,463	1,232	6,160 00
Milo maize.....tons	5	† 15	53 00	5	25	11 25
Kaffir corn.....tons	135	† 270	945 00	268	1,340	670 00
Jerusalem corn.....tons	136	† 204	612 00	64	320	160 00
Timothy.....tons	7					
Clover.....tons						
Blue grass.....tons		* 1,474	8,844 00		† 1,764	10,584 00
Alfalfa.....tons	230			329		
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced. tons	2,151	4,011	16,044 00	10,787	3,017	9,051 00
Totals.....	69,603		\$137,671 63	87,994		\$46,719 10

Wheat on hand March 1, 1893, 35,484 bushels; March 1, 1894, 7,727 bushels.

Corn on hand March 1, 1893, 98,397 bushels; March 1, 1894, 19,089 bushels.

* Product of 1892. † Product of 1893. ‡ Product estimated in tons for 1893; in bushels for 1894.

crosses the central portion of the county from east to west. The Chicago, Rock Island & Pacific crosses the northwestern corner.

The general surface is a level table-land, except along the streams, where it becomes somewhat broken and bluffy. Bottom lands average one-half mile in width and comprise 25 per cent. of the total area. Ash, hackberry, elm, box elder, cherry and cottonwood trees are found in small groves along the banks of the larger streams, there being no continuous belts of timber. The North Fork of the Solomon river, with a northeastern course, flows across the northwestern corner. The South Fork of the Solomon enters the county from the west, about $9\frac{1}{2}$ miles north of the southwestern corner. It flows with a northeastern course, and, after receiving Sand creek from the west, crosses the eastern border at about the center. Good springs are numerous, and well water is reached at an average depth of 30 feet.

Limestone—mostly magnesian—of rather an inferior quality is found in the eastern and southeastern portions. Clay suitable for the manufacture of brick is generally distributed over the county.

SUMMARY.—SHERIDAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	69,603	\$137,671 63	87,994	\$46,719 10
Animals slaughtered and sold for slaughter.....		63,597 00		90,337 00
Milk sold.....				
Poultry and eggs sold.....		13,641 00		14,608 00
Wool clip.....lbs.	36,665	5,866 40	22,200	2,886 00
Cheese.....lbs.			130	15 60
Butter.....lbs.	74,780	11,964 80	85,826	13,732 16
Garden products marketed.....		3,313 00		1,283 00
Horticultural products.....		100 00		53 00
Honey and beeswax.....lbs.				
Winemanufactured.....gals.	95	95 00	9	9 00
Wood marketed.....		11 00		
Totals.....		\$236,259 83		\$169,642 86

LIVE STOCK.—SHERIDAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,792	\$197,184 00	3,409	\$112,497 00
Mules and asses.....	218	13,516 00	219	9,198 00
Milch cows.....	2,059	41,180 00	1,747	38,434 00
Other cattle.....	6,217	105,689 00	4,007	72,126 00
Sheep.....	4,675	11,687 50	3,827	9,567 50
Swine.....	2,777	20,827 50	2,640	18,480 00
Totals.....	19,738	\$390,084 00	15,849	\$260,302 50

Number of dogs in county March 1, 1893, 571; March 1, 1894, 507.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 9.

SHERMAN COUNTY.

Sherman county lies in the northwestern corner of the state, in the second tier of counties south from the state of Nebraska, and borders on the state of Colorado on the west. It was organized in 1886, and has an area of 1,080 square miles, and

POPULATION AND VALUATION.—SHERMAN COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	6,266	5,875	\$880,808	\$97,336	\$123,349	\$278,688	\$1,380,181
Grant twp.....	577	576	\$87,110	\$5,477	.....	.....	\$92,587
Iowa twp.....	215	188	78,755	1,418	.....	.....	80,173
Goodland city.....	2,020 } 2,195	1,761 } 1,899	50,490	63,010	\$115,257	\$67,606	296,363
Itasca twp.....	175	138	53,725	2,699	.....	.....	56,424
Llanos twp.....	289	247	67,725	3,280	1,085	43,067	115,157
Lincoln twp.....	348	312	69,352	2,945	284	41,894	114,475
Logan twp.....	335	260	40,780	2,014	.....	.....	42,794
McPherson twp.....	242	207	47,690	1,542	.....	.....	49,232
Shermanville twp....	233	587	101,460	4,214	.....	.....	105,674
Smoky twp.....	589	326	54,222	2,903	4,778	39,898	101,801
State Line twp.....	306	210	52,944	2,105	.....	42,593	97,642
Union twp.....	257	449	119,520	4,062	613	.....	124,195
Voltaire twp.....	431	286	57,035	1,667	1,332	43,630	103,664
Washington twp.....	249	.....	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—SHERMAN COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	25,351	30,420	\$12,168 00	16,406	.....	.....
Spring wheat.....bu.	46,613	53,600	21,440 00	51,670	.....	.....
Corn.....bu.	28,415	340,980	109,113 60	27,003	.....	.....
Oats.....bu.	7,700	53,900	14,553 00	5,041	.....	.....
Rye.....bu.	9,662	48,310	17,391 60	6,389	19,167	\$8,050 14
Barley.....bu.	6,603	.....	.....	4,389	.....	.....
Buckwheat.....bu.	6	24	18 00	5	40	24 00
Irish potatoes.....bu.	997	54,835	47,158 10	693	6,930	6,237 00
Sweet potatoes.....bu.	3	.....	.....	5	50	45 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	3,745	.....	41,972 00	4,790	.....	74,245 00
Flax.....bu.	17	68	57 80	33	66	66 00
Tobacco.....lbs.	.....	.....	.....	11	.....	.....
Broom corn.....bu.	8,567	2,570,100	51,402 00	3,143	.....	.....
Millet and hungarian, tons	3,035	3,035	15,175 00	4,833	2,417	12,085 00
Milo maize.....tons	.....	.....	.....	.....	.....	.....
Kaffir corn.....tons	5	† 10	35 00	60	300	150 00
Jerusalem corn.....tons	127	† 191	573 00	63	315	157 50
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	13	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	56	* 239	1,434 00	154	† 58	348 00
Orchard grass.....tons	2	.....	.....	.....	.....	.....
Other tame grasses.....tons	4	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	4,795	448	2,688 00	2,363	381	1,143 00
Totals.....	145,716	.....	\$335,179 10	127,051	.....	\$102,550 64

Wheat on hand March 1, 1893, 101,209 bushels; March 1, 1894, 37,973 bushels.

Corn on hand March 1, 1893, 105,945 bushels; March 1, 1894, 21,982 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

ranks among the counties of the state as the 72d in population. Goodland, situated in the center, is the county seat.

The Chicago, Rock Island & Pacific railroad crosses the central portion of the county from east to west.

The general surface is undulating, there being but a very small proportion of rough land. Timber is confined to a few scattering trees along the North Fork of the Smoky Hill river, and the North and South Forks of Sappa creek. The North Fork of the Smoky Hill river enters the county near the southwestern corner, and flows northeast and southeast for a distance of about 27 miles, leaving the county at its southern border. The North and South Forks of Sappa creek have their sources in the central portion, and flow northeast over the eastern boundary. Beaver and Little Beaver creeks have a northeastern course, and flow over the northern border into Cheyenne county.

Limestone has been discovered in the southwestern portion of the county.

SUMMARY.—SHERMAN COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

<i>Products.</i>	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	145,716	\$335,179 10	127,051	\$102,550 64
Animals slaughtered and sold for slaughter.....		46,517 00		58,588 00
Milk sold.....		3,300 00		2,102 00
Poultry and eggs sold.....		16,224 00		13,540 00
Wool clip.....lbs.	200	32 00		12 00
Cheese.....lbs.	190	20 90	100	
Butter.....lbs.	136,347	21,815 52	122,510	19,601 60
Garden products marketed.....		4,164 00		1,671 00
Horticultural products.....				
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$127,252 52		\$198,065 24

LIVE STOCK.—SHERMAN COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	3,902	\$202,904 00	4,187	\$138,171 00
Mules and asses.....	417	25,854 00	314	13,188 00
Milch cows.....	2,608	52,160 00	2,391	52,602 00
Other cattle.....	3,830	65,110 00	3,008	54,144 00
Sheep.....	168	420 00	171	427 50
Swine.....	2,587	19,402 50	2,750	19,250 00
Totals.....	13,512	\$365,850 50	12,821	\$277,782 50

Number of dogs in county March 1, 1893, 741; March 1, 1894, 584.

SMITH COUNTY.

Was organized in 1872; has an area of 900 square miles, and ranks as the 41st county in the state in population. Smith Centre, situated about the center, is the county seat. Gaylord and Harlan, in the south-central portion, are places of much importance to the surrounding country.

The Chicago, Rock Island & Pacific railroad crosses the central portion of the county from east to west, and the Atchison, Colorado & Pacific, of the Missouri Pacific, the southwestern corner.

The general surface is an undulating prairie, with some bluffs and rough lands near the streams. Bottoms average about one mile in width, and comprise about 15 per cent. of the total area. The bottoms of the North Fork of the Solomon in some places spread out to a width of five miles. Narrow fringes of timber skirt all of the streams, averaging about 20 rods in width. They contain the following varieties of trees: Cottonwood, oak, elm, ash, cedar, box elder, walnut, hackberry, and willow. Springs, although not numerous, are generally of large size and great value. Well water is obtained at a depth of from 10 to 15 feet on the bottoms, and at a greater depth on the uplands. The North Fork of the Solomon river enters the county from the west, six miles north of the southwestern corner, and, after flowing east to the town of Gaylord, for a distance of about 10 miles, turns to the southeast and crosses the southern boundary at a point a little east of the center.

POPULATION AND VALUATION.—SMITH COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	14,529	14,476	\$2,016,635	\$676,700	\$190,045	\$332,377	\$3,215,767
Gaylord city.....	366 } 832	333 } 794	\$64,064	\$33,144	\$26,109	\$3,611	\$126,928
Banner twp.....	466 } 329	461 } 376	82,898	10,988			93,886
Beaver twp.....		610	89,545	28,112	2,226	46,072	165,955
Blaine twp.....	279 } 790	290 } 861	100,976	55,860	27,003	44,739	228,588
Cedar twp.....	511 } 787	571 } 1,173	91,057	68,858	89,721	48,686	298,322
Smith Centre city.....	1,010 } 501	787 } 386					
Center twp.....		531	82,347	19,790	576		102,713
Cora twp.....		465	95,014	35,914			130,928
Crystal Plains twp....		401	82,255	13,843			76,098
Dor twp.....		331	71,260	11,077		6,478	88,815
Garfield twp.....		451	65,175	24,803			89,978
German twp.....		592	81,608	15,243	4,240	35,138	136,229
Harlan twp.....		660	96,801	21,717	10,725	15,275	144,618
Harvey twp.....		412	67,123	6,792		14,271	88,186
Houston twp.....		615	100,342	47,112	4,049	45,182	196,685
Lane twp.....		466	79,894	22,343			102,237
Lincoln twp.....		560	72,530	21,143			93,673
Logan twp.....		528	76,016	42,357			118,373
Martin twp.....							
Lebanon city.....	387 } 1,068	457 } 1,171	88,992	45,782	25,396	44,477	204,647
Oak twp.....	681 } 442	714 } 452	67,391	25,176			92,567
Pawnee twp.....		551	87,478	25,658			113,136
Pleasant twp.....		512	80,047	24,291			104,338
Swan twp.....		443	70,911	11,164			82,075
Washington twp.....		443	85,364	24,863			110,227
Webster twp.....		555	78,456	16,899			95,355
White Rock twp.....		431	79,091	23,771		28,448	131,310
Valley twp.....							

A superior quality of magnesian limestone is found in all portions of the county, and a rock closely resembling granite is quarried in many places. Yellow ochre has been discovered in small quantities on Beaver creek, in Pleasant township. Clay suitable for the manufacture of brick is found near the city of Smith Centre and in other localities. Small beds of gypsum exist in the northern portion.

FARM AND CROP STATISTICS.—SMITH COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	59,518	119,035	\$53,565 75	58,562	192,668	\$92,480 64
Spring wheat.....bu.	480	672	268 80	210	300	123 00
Corn.....bu.	143,624	1,579,864	394,966 00	140,672	422,016	173,026 56
Oats.....bu.	27,645	55,290	13,822 50	15,993	55,970	17,350 70
Rye.....bu.	8,856	61,992	26,656 56	4,497	31,479	12,906 39
Barley.....bu.	277	1,385	457 05	76	380	152 00
Buckwheat.....bu.	62	310	232 50	9	72	43 20
Irish potatoes.....bu.	1,522	50,226	39,678 54	1,304	18,256	16,247 84
Sweet potatoes.....bu.	3	60	60 00	3	33	33 00
Castor beans.....bu.						
Sorghum.....bu.	165		2,166 00	459		2,907 00
Flax.....bu.	113	565	480 25	65	195	195 00
Tobacco.....lbs.				1		
Broom corn.....lbs.	741	444,600	13,338 00	421	42,100	1,052 50
Millet and hungarian, tons	5,739	7,173	35,865 00	8,511	6,384	31,920 00
Milo maize.....tons						
Kaffir corn.....tons	23	† 69	242 00	32	96	48 00
Jerusalem corn.....tons	2	† 4	12 00			
Timothy.....tons	306			73		
Clover.....tons	17			9		
Blue grass.....tons	98			29		
Alfalfa.....tons	589	* 3,627	21,762 00	779	† 3,211	19,266 00
Orchard grass.....tons	14			30		
Other tame grasses.....tons	21			47		
Prairie grass, fenced..tons	78,659	18,884	75,536 00	57,724	19,474	77,896 00
Totals.....	328,474		\$679,108 95	289,506		\$445,647 83

Wheat on hand March 1, 1893, 126,688 bushels; March 1, 1894, 57,651 bushels.

Corn on hand March 1, 1893, 1,538,803 bushels; March 1, 1894, 663,495 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—SMITH COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	328,474	\$679,108 95	289,506	\$445,647 83
Animals slaughtered and sold for slaughter.....		577,199 00		743,916 00
Milk sold.....		1,489 00		315 00
Poultry and eggs sold.....		73,879 00		69,495 00
Wool clip.....lbs.	920	147 20	1,177	153 01
Cheese.....lbs.	3,625	398 75	4,130	495 60
Butter.....lbs.	423,326	67,732 16	450,080	72,012 80
Garden products marketed.....		3,089 00		1,590 00
Horticultural products.....		12,739 00		2,370 00
Honey and beeswax.....lbs.	1,799	324 17	284	5,112 00
Wine manufactured.....gals.	188	188 00	30	30 00
Wood marketed.....		176 00		208 00
Totals.....		\$1,416,470 23		\$1,341,345 24

LIVE STOCK.—SMITH COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	12,663	\$658,476 00	12,701	\$419,133 00
Mules and asses.....	852	52,824 00	858	36,036 00
Milch cows.....	7,789	155,780 00	7,526	165,572 00
Other cattle.....	17,429	296,293 00	13,953	251,154 00
Sheep.....	1,035	2,587 50	1,953	4,882 50
Swine.....	36,872	276,540 00	37,768	264,376 00
Totals.....	76,640	\$1,442,500 50	74,759	\$1,141,153 50

Number of dogs in county March 1, 1893, 2,332; March 1, 1894, 2,183.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

STAFFORD COUNTY.

It was organized in 1879. It has an area of 792 square miles, and ranks as the 64th county in point of population. St. John, a little south and west of the center, is the county seat. Stafford, about 10 miles to the southeast of St. John, is the second place in size in the county. Macksville, in the southwestern portion, is a point of importance to the surrounding country.

The Atchison, Topeka & Santa Fé railroad crosses the county a little south of the center; and the Denver, Memphis & Atlantic, a division of the Missouri Pacific system, crosses the central portion from the southeastern to the northwestern corner.

The general surface is a gently rolling prairie, there being but a very small proportion unfit for cultivation. Bottom lands average a width of one mile, and comprise about 15 per cent. of the total area. A few scattering trees are met with along Rattlesnake creek, the amount of timber in the county being inconsiderable; cotton-

POPULATION AND VALUATION.—STAFFORD COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	9,163	8,688	\$1,385,116	\$245,225	\$155,780	\$334,940	\$2,121,061
Albano twp.....	305	300	\$52,905	\$6,547	.....	.....	\$59,452
Byron twp.....	345	388	66,157	6,407	.....	.....	72,564
Clear Creek twp.....	255	203	40,156	3,370	.....	.....	43,526
Cleveland twp.....	200	171	59,790	4,880	.....	.....	64,670
Cooper twp.....	842	599	107,378	16,590	\$376	\$26,552	150,896
Douglas twp.....	195	208	61,579	5,495	.....	12,165	79,239
Fairview twp.....	428	460	85,481	11,362	.....	46,072	142,915
Macksville city.....	230 }	182 }	.....	.....	.....	.....	.....
Farmington twp.....	280 }	236 }	71,700	9,665	13,408	36,105	130,878
Hayes twp.....	362	345	77,488	14,268	1,084	13,351	106,191
Lincoln twp.....	300	293	83,341	7,736	.....	12,165	103,242
Ohio twp.....	401	532	55,700	9,514	.....	27,688	92,902
Putnam twp.....	285	292	82,966	15,248	.....	.....	98,214
Richland twp.....	318	292	68,869	5,450	219	34,748	109,286
Rose Valley twp.....	331	325	66,962	7,525	68	.....	74,555
Seward twp.....	623	619	118,746	20,284	1,083	30,869	170,982
St. John city.....	904 }	828 }	.....	.....	.....	.....	.....
St. John twp.....	320 }	345 }	75,377	56,690	75,003	11,324	218,394
Stafford city.....	879 }	703 }	81,682	30,678	63,808	57,259	233,427
Stafford twp.....	472 }	450 }	.....	.....	.....	.....	.....
Union twp.....	428	465	58,498	7,901	305	.....	66,704
York twp.....	460	452	70,341	5,615	426	26,642	103,024

wood is the principal variety found. A salt marsh of considerable size is found in the northeastern corner of the county, covering a large portion of sections 30 and 31, in township 21, range 11, and sections 5, 6, 7 and 8 of township 22 in the same range. There are several salt springs and some fresh-water springs serving as feeders to this marsh. The water of the Rattlesnake creek is salt, from salt springs, and along this stream salt water in wells is a common occurrence. Rattlesnake creek enters the county at the southwestern corner, and, flowing northeast, leaves it on the east, two miles south of the northeastern corner, and becomes tributary to the Arkansas river in Rice county.

Poor building stone is found in several sections, and is of very little value. Brick-makers find a clay suitable for the manufacture of brick. Gypsum beds are found in nearly every portion at a depth below the surface of from 10 to 20 feet.

FARM AND CROP STATISTICS.—STAFFORD COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	86,811	364,602	\$145,840 80	102,583	307,746	\$116,943 48
Spring wheat.....bu.	3			76		
Corn.....bu.	43,792	306,544	101,159 52	59,831	299,155	101,712 70
Oats.....bu.	9,127	136,905	38,333 40	5,767	10,608	3,182 40
Rye.....bu.	1,213	9,704	3,687 52	1,368	12,312	4,924 80
Barley.....bu.	649			416	1,664	798 88
Buckwheat.....bu.	7	70	52 50	15	120	72 00
Irish potatoes.....bu.	244	6,100	5,612 00	214	2,140	2,140 00
Sweet potatoes.....bu.	99	4,950	4,950 00	17	1,275	1,402 50
Castor beans.....bu.						
Sorghum.....bu.	1,145		15,163 00	2,355		15,658 00
Flax.....bu.	12	48	40 80	2	8	8 00
Tobacco.....lbs.	110					
Broom corn.....lbs.	1,685	842,500	25,275 00	1,888	377,600	13,216 00
Millet and hungarian.....tons	2,995	3,743	11,229 00	2,175	1,632	6,528 00
Milo maize.....tons	84	† 252	882 00	91	455	204 75
Kaffir corn.....tons	410	† 1,230	4,305 00	1,505	30,100	15,050 00
Jerusalem corn.....tons	28	† 42	126 00	24	120	60 00
Timothy.....tons				1		
Clover.....tons	5			3		
Blue grass.....tons	2			2		
Alfalfa.....tons	184	* 1,458	8,748 00	274	† 2,817	16,902 00
Orchard grass.....tons	10			12		
Other tame grasses.....tons	5			12		
Prairie grass, fenced.....tons	27,351	10,065	30,195 00	19,841	14,497	57,988 00
Totals.....	175,971		\$395,599 54	198,472		\$356,791 51

Wheat on hand March 1, 1893, 100,822 bushels; March 1, 1894, 87,791 bushels.

Corn on hand March 1, 1893, 206,559 bushels; March 1, 1894, 113,267 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—STAFFORD COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	175,971	\$395,599 54	198,472	\$356,791 51
Animals slaughtered and sold for slaughter.....		258,319 00		229,403 00
Milk sold.....		303 00		
Poultry and eggs sold.....		71,563 00		21,110 00
Wool clip.....lbs.	13,284	2,125 44	12,240	1,591 20
Cheese.....lbs.	9,210	1,013 10	2,100	252 00
Butter.....lbs.	190,084	30,413 44	254,317	40,690 72
Garden products marketed.....		3,714 00		2,738 00
Horticultural products.....		84,422 00		1,138 00
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	175	175 00	61	61 00
Wood marketed.....		12 00		23 00
Totals.....		\$847,659 52		\$653,803 42

LIVE STOCK.—STAFFORD COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	6,115	\$317,980 00	7,262	\$239,646 00
Mules and asses.....	1,055	65,410 00	1,328	55,776 00
Milch cows.....	3,976	79,520 00	4,170	91,740 00
Other cattle.....	9,731	165,427 00	8,648	156,384 00
Sheep.....	1,164	2,910 00	1,132	2,830 00
Swine.....	8,121	60,907 50	12,708	88,956 00
Totals.....	30,162	\$692,154 50	35,288	\$635,332 00

Number of dogs in county March 1, 1893, 1,181; March 1, 1894, 1,362.

Number of sheep killed by dogs, ending March 1, 1894, 140.

Number of sheep killed by wolves, year ending March 1, 1894, 6.

STANTON COUNTY.

In 1887, the legislature detached from the territory of Hamilton county an area of 672 square miles, giving to it the name of Stanton county. It lies in the southwestern corner of the state, on the Colorado border, and in the second tier of counties north from the Indian Territory. In point of population, it ranks as the 103d. Johnson, situated in the center, is the county seat.

There are no railroads in the county.

The surface of the county is generally level, being slightly undulating in some places. Bottom lands average one-half of a mile in width, and comprise but a very small proportion of the total area. Bear creek flows across the county in a north-easterly direction, and a branch of the North Fork of the Cimarron river across the southern portion from west to east.

Excellent well water is reached at an average depth of 75 feet. Magnesian limestone is found in the southwestern portion, and gypsum along the streams.

POPULATION AND VALUATION.—STANTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	* 985.	772	\$413,301	\$20,095	.....	.....	\$453,527
Borders twp.	108	86	\$68,640	\$783	.....	.....	\$69,423
Falkenstein twp.	85	87	69,821	1,739	.....	.....	71,560
Liverpool twp.	194	97	44,055	2,482	.....	.....	46,537
Mitchell twp.	86	87	45,291	2,235	.....	.....	47,526
Roanoke twp.	77	83	45,817	2,183	.....	.....	48,000
Robinson twp.	154	98	44,461	5,094	.....	.....	49,555
Stanton twp.	281	234	95,216	5,579	.....	.....	120,926

*Population of 1892; no returns for 1893.

FARM AND CROP STATISTICS.—STANTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	10,997			5,359	1,605	\$690 15
Spring wheat.....bu.	83			27		
Corn.....bu.	5,280			813	4,065	1,829 25
Oats.....bu.	2,060			223		
Rye.....bu.	1,941			507	2,535	1,090 05
Barley.....bu.	1,590			111		
Buckwheat.....bu.						
Irish potatoes.....bu.	38			4	200	200 00
Sweet potatoes.....bu.	11	550	\$550 00			
Castor beans.....bu.	78	156	179 40	2	8	8 00
Sorghum.....bu.	2,146		13,084 00	2,283		13,581 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.	6,818	1,363,600	27,272 00	2,598	259,800	8,443 50
Millet and hungarian.....tons	45	22	66 00	42	21	105 00
Milo maize.....tons	1,176	‡ 2,352	8,232 00	875	12,250	5,512 50
Kaffir corn.....tons	1,321	‡ 1,981	6,933 00	1,018	10,180	5,090 05
Jerusalem corn.....tons	2,299	‡ 2,299	6,897 00	1,716	8,580	4,290 00
Timothy.....tons						
Clover.....tons						
Blue grass.....tons	5					
Alfalfa.....tons	10	* 60	360 00			
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	80	40	240 00	2,775		
Totals.....	35,978		\$63,813 40	18,353		\$40,839 45

Wheat on hand March 1, 1893, 8,880 bushels; March 1, 1894, 102 bushels.

Corn on hand March 1, 1893, 2,983 bushels; March 1, 1894, 110 bushels.

*Product of 1892. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—STANTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	35,978	\$63,813 40	18,353	\$40,839 45
Animals slaughtered and sold for slaughter.....		11,255 00		3,852 00
Milk sold.....		100 00		35 00
Poultry and eggs sold.....		3,666 00		51,759 00
Wool clip.....lbs.			1,900	247 00
Cheese.....lbs.	160	17 60		
Butter.....lbs.	23,119	3,699 04	21,008	3,361 28
Garden products marketed.....		169 00		32 00
Horticultural products.....		4 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gal.				
Wood marketed.....				
Totals.....		\$82,724 04		\$100,125 73

LIVE STOCK.—STANTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	923	\$47,996 00	794	\$26,202 00
Mules and asses.....	124	7,688 00	69	2,898 00
Milch cows.....	811	16,220 00	513	11,286 00
Other cattle.....	1,398	23,766 00	1,149	20,682 00
Sheep.....	350	875 00		
Swine.....	662	4,965 00	380	2,660 00
Totals.....	4,268	\$101,510 00	2,905	\$63,728 00

Number of dogs in county March 1, 1893, 151; March 1, 1894, 158.

Number of sheep killed by dogs, year ending March 1, 1894, 1.

Number of sheep killed by wolves, year ending March 1, 1894, 5.

STEVENS COUNTY.

Organized in 1886. It contains an area of 729 square miles, and ranks as the 102d county in population. The town of Hugoton, near the center, is the county seat.

There are no railroads in the county.

The general surface is an undulating prairie, interspersed with sand hills. Bottom lands on the Cimarron river are from one-half to three-fourths of a mile wide,

POPULATION AND VALUATION.—STEVENS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	1,144	797	\$795,236	\$8,525	\$20,347	.....	\$819,727
Center twp.....	142	107	\$75,135	\$1,314	\$15,966	.....	\$92,415
Cleveland twp.....	120	60	93,822	318	.....	.....	94,140
Dermot twp.....	80	60	101,448	306	.....	.....	101,754
Harmony twp.....	158	123	73,223	503	.....	.....	73,726
Lafayette twp.....	115	81	87,468	162	.....	.....	87,630
Lincoln twp.....	86	71	60,381	3,207	.....	.....	63,588
Moscow twp.....	176	111	119,448	691	.....	.....	120,139
Niagara twp.....	49	43	54,924	117	.....	.....	55,041
Voorhees twp.....	76	62	76,386	1,146	.....	.....	77,532
Woodsdale twp.....	142	89	53,001	761	4,381	.....	53,762

FARM AND CROP STATISTICS.—STEVENS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	7,310	.....	.....	2,620	.....	.....
Spring wheat.....bu.	10	.....	.....	.....	.....	.....
Corn.....bu.	2,138	.....	.....	819	4,095	\$2,252 25
Oats.....bu.	2,031	.....	.....	707	336	127 68
Rye.....bu.	1,189	.....	.....	229	.....	.....
Barley.....bu.	1,720	.....	.....	173	1,730	778 50
Buckwheat.....bu.	.....	.....	.....	.....	.....	.....
Irish potatoes.....bu.	29	.....	.....	9	180	180 00
Sweet potatoes.....bu.	5	250	\$250 00	8	400	400 00
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	1,661	.....	10,795 00	1,757	.....	8,610 00
Flax.....bu.	.....	.....	.....	6	12	12 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	7,702	1,540,400	46,212 00	4,607	322,490	9,674 70
Millet and hungarian, tons	339	84	420 00	368	184	920 00
Milo maize.....tons	440	† 440	1,540 00	431	4,310	1,939 50
Kafir corn.....tons	1,387	† 2,081	7,283 00	1,248	12,480	6,240 00
Jerusalem corn.....tons	691	† 691	2,073 00	734	7,340	3,670 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	13	* 132	792 00	.....	†	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	445	209	1,045 00	1,445	82	246 00
Totals.....	27,110	.....	\$70,410 00	15,161	.....	\$35,050 63

Wheat on hand March 1, 1893, 6,335 bushels; March 1, 1894, 95 bushels.

Corn on hand March 1, 1893, 1,993 bushels; March 1, 1894, 209 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

and cover about 2 per cent. of the county area. This county is almost without timber. The Cimarron river is the only stream of importance, and flows northeast across the northwestern corner.

Good sandstone crops out of the bluffs and breaks of the river. A good quality of clay is found in the eastern portion, and small deposits of gypsum from two to six feet below the surface.

SUMMARY.—STEVENS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	27,110	\$70,410 00	15,161	\$35,062 63
Animals slaughtered and sold for slaughter.....		7,631 00		4,948 00
Milk sold.....				15 00
Poultry and eggs sold.....		1,166 00		1,126 00
Wool clip.....lbs.	120	19 20	1,137	147 81
Cheese.....lbs.	450	49 50		
Butter.....lbs.	18,302	2,928 32	16,192	2,590 72
Garden products marketed.....		436 00		15 00
Horticultural products.....		175 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	3	3 00		
Wood marketed.....				
Totals.....		\$82,818 02		\$43,905 16

LIVE STOCK.—STEVENS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	876	\$45,552 00	582	\$19,206 00
Mules and asses.....	141	8,742 00	137	5,754 00
Milch cows.....	803	16,060 00	650	14,300 00
Other cattle.....	1,914	32,538 00	1,015	18,270 00
Sheep.....	20	50 00	386	965 00
Swine.....	563	4,222 50	246	1,722 00
Totals.....	4,317	\$107,164 50	3,016	\$60,217 00

Number of dogs in county March 1, 1893, 149; March 1, 1894, 100.

SUMNER COUNTY.

Was organized in 1871; has an area of 1,188 square miles, and ranks as the 7th county in population in the state. Wellington, on the north bank of Slate creek, near the center, is the county seat. Caldwell, in the southwestern portion, near the Indian Territory, is the second place in size, and is an important trading point. Oxford, in the eastern portion, Conway Springs, in the northwestern, Belle Plaine and Mulvane, in the northeastern, Geuda Springs, in the southeastern, South Haven and Hunnewell, in the southern, and Argonia, in the western, are places of importance, and do an extensive trade with the surrounding country.

Divisions of the Atchison, Topeka & Santa Fé, Missouri Pacific, St. Louis & San Francisco and Chicago, Rock Island & Pacific railroads extend into all portions of the county.

The general surface is a gently undulating prairie, having the appearance in many places of being nearly level. Bottom lands average a width of $2\frac{1}{2}$ miles, and comprise 20 per cent. of the total area. Timber belts on the streams are from five rods to one-half mile in width; the following are the principal varieties of trees: Cottonwood, willow, ash, box elder, red and white elm, hackberry, bur oak, mulberry, coffee bean, blue ash, and honey locust. Springs are not plentiful, and well water is reached at depths varying from 10 to 40 feet. The Arkansas river flows southeast across the northeastern corner, and has the Ninneseah river and Cowskin creek as its tributaries from the northwest.

A thin stratum of bastard limestone is found only in the highest ridges. There are two quarries, 12 miles southeast of Wellington, that produce a very fair quality of marble. Lime and sandstone are found in many parts of the county, but in small quantities, and of an inferior quality. Fire clay is found at a great depth in the

POPULATION AND VALUATION.—SUMNER COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	31,684	27,126	\$3,729,368	\$814,530	\$1,028,351	\$1,474,290	\$7,046,539
Avon twp.....	440	396	\$132,731	\$15,069	\$46,026	\$44,190	\$238,016
Belle Plaine city.....	684 } 1,465	657 } 1,413	162,935	48,779	.....	79,000	290,714
Belle Plaine twp.....	781 }	756 }	145,010	15,130	210	32,570	192,290
Bluff twp.....	714	545	164,130	80,983	224,546	111,410	581,069
Caldwell city.....	2,138 } 2,981	1,388 } 1,981	103,855	10,975	.....	.....	114,833
Caldwell twp.....	843 }	593 }	100,346	29,563	39,804	39,690	209,403
Chikaskia twp.....	458	408	91,993	7,600	.....	15,290	114,880
Conway Springs city.....	723 } 1,263	634 } 1,200	106,261	26,290	24,409	69,910	226,870
Conway twp.....	540 }	566 }	93,610	9,432	.....	28,470	131,512
Creek twp.....	440	442	165,615	22,371	11,973	90,300	290,259
Argonia city.....	433 } 1,013	356 } 877	95,510	32,300	32,608	74,570	234,988
Dixon twp.....	580 }	521 }	98,710	18,280	.....	.....	116,990
Downs twp.....	685	628	151,760	25,020	2,843	33,920	213,543
Eden twp.....	459	436	104,286	11,735	531	46,590	163,142
Falls twp.....	1,166	860	101,810	11,045	1,920	20,440	135,215
Mulvane city.....	476 } 1,038	415 } 877	124,870	13,215	893	33,980	172,958
Gore twp.....	562 }	556 }	143,735	23,808	1,351	38,010	206,904
Greene twp.....	521	521	82,560	9,182	.....	.....	91,742
Guelph twp.....	1,196	822	119,700	19,473	6,278	44,410	189,861
Harmon twp.....	603	518	153,960	46,475	41,296	61,920	303,651
Illinois twp.....	642	539	121,697	16,260	.....	22,480	160,437
Jackson twp.....	706	548	102,221	17,175	864	26,050	146,310
London twp.....	745	697	98,823	10,187	.....	.....	109,010
Morris twp.....	477	396	142,400	23,185	24,254	34,260	224,099
Osborn twp.....	702	609	199,010	176,720	527,506	211,480	1,114,716
Oxford city.....	650 } 1,358	587 } 1,219	169,375	34,787	24,417	88,280	316,859
Oxford twp.....	708 }	632 }	101,950	8,946	3,036	29,030	142,962
Palestine twp.....	617	550	102,221	17,175	864	26,050	146,310
Ryan twp.....	735	792	98,823	10,187	.....	.....	109,010
Seventy Six twp.....	588	471	127,590	11,390	1,240	65,170	205,390
Hunnell city.....	290 } 1,748	162 } 1,309	169,375	34,787	24,417	88,280	316,859
South Haven city.....	474 }	399 }	101,950	8,946	3,036	29,030	142,962
South Haven twp.....	984 }	748 }	102,221	17,175	864	26,050	146,310
Springdale twp.....	570	569	98,823	10,187	.....	.....	109,010
Sumner twp.....	497	461	142,400	23,185	24,254	34,260	224,099
Valverde twp.....	620	518	199,010	176,720	527,506	211,480	1,114,716
Gueda Springs city.....	470 } 1,452	292 } 1,098	142,400	23,185	24,254	34,260	224,099
Walton twp.....	982 }	806 }	142,400	23,185	24,254	34,260	224,099
Wellington city.....	5,071 } 5,785	4,652 } 5,332	199,010	176,720	527,506	211,480	1,114,716
Wellington twp.....	714 }	680 }	199,010	176,720	527,506	211,480	1,114,716

southeastern portion of the county. An inferior quality of potters' clay exists in small quantities on Slate creek. Gypsum beds, in thick and thin layers, are developed in Green township, the product being much used for building, and could be utilized for cement and plaster. Beds of mineral paint are found in Green township, but not yet utilized. Salt and mineral springs are located at Genda, and are much resorted to by invalids. While boring at Wellington for coal, a vast deposit of rock salt was discovered at a depth of 225 feet.

FARM AND CROP STATISTICS.—SUMNER COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	274,483	2,717,374	\$1,222,818 30	272,910	3,012,924	\$1,144,911 12
Spring wheat.....bu.	3	30	12 00	50		
Corn.....bu.	103,262	826,096	280,872 64	100,117	500,565	225,263 25
Oats.....bu.	46,778	1,029,116	277,861 32	43,943	449,968	125,991 04
Rye.....bu.	1,038	12,456	4,982 40	830	8,300	3,154 00
Barley.....bu.	392			258	1,032	412 80
Buckwheat.....bu.	7	35	26 25	1	8	4 80
Irish potatoes.....bu.	1,075	37,625	34,991 25	851	19,573	14,875 48
Sweet potatoes.....bu.	97	4,850	4,850 00	53	1,961	1,313 87
Castor beans.....bu.						
Sorghum.....bu.	561		7,677 00	379		4,610 00
Flax.....bu.	21	84	71 40			
Tobacco.....lbs.						
Broom corn.....lbs.				2		
Millet and hungarian, tons	1,948	1,948	9,740 00	1,030	1,030	5,150 00
Milomalze.....tons	47	† 141	493 00	183	1,830	823 50
Kaffir corn.....tons	75	† 225	788 00	820	8,200	4,100 00
Jerusalem corn.....tons				22	† 220	110 00
Timothy.....tons	1,010			602		
Clover.....tons	279			75		
Blue grass.....tons	350			363		
Alfalfa.....tons	765	* 1,422	8,532 00	1,070	† 605	3,630 00
Orchard grass.....tons	38			26		
Other tame grasses.....tons	148			17		
Prairie grass, fenced, tons	128,697	27,586	137,930 00	127,168	5,734	22,936 00
Totals.....	561,074		\$1,991,645 56	550,770		\$1,557,285 86

Wheat on hand March 1, 1893, 525,329 bushels; March 1, 1894, 376,353 bushels.

Corn on hand March 1, 1893, 773,574 bushels; March 1, 1894, 105,799 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—SUMNER COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	561,074	\$1,991,645 56	550,770	\$1,557,285 86
Animals slaughtered and sold for slaughter.....		1,042,697 00		741,179 00
Milk sold.....		5,307 00		4,786 00
Poultry and eggs sold.....		94,645 00		80,251 00
Wool clip.....lbs.	6,230	996 80	6,800	884 00
Cheese.....lbs.	5,475	602 25	4,130	495 60
Butter.....lbs.	759,704	121,552 64	759,620	121,539 20
Garden products marketed.....		13,278 00		5,733 00
Horticultural products.....		9,544 00		3,861 00
Honey and beeswax.....lbs.	4,000	721 75	175	31 50
Wine manufactured.....gals.	597	597 00	1,094	1,094 00
Wood marketed.....		329 00		1,321 00
Totals.....		\$3,281,916 00		\$2,518,461 16

LIVE STOCK.—SUMNER COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	24,299	\$1,263,548 00	20,707	\$683,331 00
Mules and asses	2,738	169,756 00	2,428	101,976 00
Milch cows	12,700	254,000 00	10,250	225,500 00
Other cattle	29,796	506,532 00	18,756	337,608 00
Sheep	2,690	6,725 00	1,266	3,165 00
Swine	34,467	258,502 50	28,207	197,449 00
Totals	106,690	\$2,459,063 50	81,614	\$1,549,029 00

Number of dogs in county March 1, 1893, 3,622; March 1, 1894, 3,311.

Number of sheep killed by wolves, year ending March 1, 1894, 54.

THOMAS COUNTY.

Organized in 1885, contains 1,080 square miles, and ranks as the 79th county in population in the state. The town of Colby, situated in the center, is the county seat, and has the offices of the United States land district.

The Chicago, Rock Island & Pacific crosses a little north of the center of the county. The Union Pacific, Lincoln & Colorado, of the Union Pacific, connects that line with the Chicago, Kansas & Nebraska at the town of Colby.

Bluffs and rough lands occur on some of the streams, but the general surface is a gently undulating prairie. Occasional clumps of trees, principally of the cotton-wood variety, are met with on the banks of rivers and creeks. There are many artificial groves in the county. The county is well watered, having an abundance of water courses. The South Fork of the Saline river and the South and North Forks of the Solomon river have their sources in the southwestern portion, and flow east and northeast across the eastern border.

Sandstone of an inferior quality is found in several localities.

POPULATION AND VALUATION.—THOMAS COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	5,032	4,415	\$1,212,219	\$88,388	\$119,060	\$472,307	\$1,891,974
Barrett twp.	350	342	\$108,990	\$4,800	\$231	.....	\$114,111
Hale twp.	463	406	118,130	5,470	2,330	\$89,005	214,935
Kingery twp.	420	365	149,240	3,840	.....	.....	153,080
Lacey twp.	223	207	36,368	2,063	562	44,525	83,518
Colby city	722	557	171,245	42,934	111,992	161,896	488,067
Morgan twp.	438	375	240,700	6,630	1,042	106,515	354,887
Randall twp.	926	779	111,985	6,320	339	.....	118,644
Rovohl twp.	394	391	37,351	6,878	2,564	46,163	92,956
Smith twp.	254	231	168,670	6,640	.....	24,203	199,513
Summers twp.	414	359	69,540	2,723	.....	.....	72,263
Wendell twp.	428	403	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—THOMAS COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	72,313	8,676	\$3,904 20	79,047	2,371	\$1,114 37
Spring wheat.....bu.	17,652			14,263	8,556	3,593 52
Corn.....bu.	35,692	178,460	53,538 00	26,911	13,445	5,382 00
Oats.....bu.	10,504	126,048	31,512 00	5,698	3,416	1,127 28
Rye.....bu.	6,400	51,200	19,456 00	3,140	6,280	3,140 00
Barley.....bu.	7,457	44,742	14,317 44	3,363	13,452	6,053 40
Buckwheat.....bu.				6	48	28 80
Irish potatoes.....bu.	644	6,440	3,864 00	449	4,490	4,041 00
Sweet potatoes.....bu.						
Castor beans.....bu.						
Sorghum.....bu.	3,782		23,440 00	4,095		21,075 00
Flax.....bu.	90	450	382 50	57	171	171 00
Tobacco.....lbs.						
Broom corn.....lbs.	4,536	2,721,600	81,648 00	2,953	147,650	4,429 50
Millet and hungarian, tons	2,413	1,809	10,854 00	2,613	653	3,265 00
Milo maize.....tons	14	‡ 42	147 00	1	10	4 50
Kaffir corn.....tons	174	‡ 261	913 00	319	3,190	1,595 00
Jerusalem corn.....tons	183	‡ 183	549 00	178	1,780	890 00
Timothy.....tons	24					
Clover.....tons	21					
Blue grass.....tons						
Alfalfa.....tons	96	* 1,337	8,022 00	13	† 787	4,722 00
Orchard grass.....tons						
Other tame grasses.....tons						
Prairie grass, fenced.....tons	8,951	1,561	4,683 00	8,296	813	3,252 00
Totals.....	170,946		\$257,230 14	151,404		\$63,884 37

Wheat on hand March 1, 1893, 72,252 bushels; March 1, 1894, 11,099 bushels.

Corn on hand March 1, 1893, 73,323 bushels; March 1, 1894, 15,296 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—THOMAS COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	170,946	\$257,230 14	151,405	\$63,884 37
Animals slaughtered and sold for slaughter.....		68,516 00		57,459 00
Milk sold.....		435 00		320 00
Poultry and eggs sold.....		12,820 00		11,613 00
Wool clip.....lbs.	750	120 00	225	29 25
Cheese.....lbs.	5,020	552 20	1,361	163 32
Butter.....lbs.	133,737	21,397 92	121,068	19,370 88
Garden products marketed.....		1,998 00		380 00
Horticultural products.....				
Honey and beeswax.....lbs.	200	36 00	25	4 60
Wine manufactured.....gals.	1	1 00		
Wood marketed.....				
Totals.....		\$363,106 26		\$153,224 42

LIVE STOCK.—THOMAS COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	4,417	\$229,684 00	4,460	\$147,180 00
Mules and asses.....	424	26,288 00	404	16,968 00
Milch cows.....	2,789	55,780 00	2,262	49,764 00
Other cattle.....	4,749	80,733 00	3,275	58,950 00
Sheep.....	215	537 50	58	145 00
Swine.....	3,124	23,430 00	2,186	15,302 00
Totals.....	15,718	\$416,452 50	12,645	\$288,309 00

Number of dogs in county March 1, 1893, 741; March 1, 1894, 673.

TREGO COUNTY.

A west-central county, lying in the fourth tier east from the Colorado state line. It has an area of 900 square miles, was organized in 1879, and now ranks as the 87th county in population in the state. The town of Wa Keeney, lying north of the center, is the county seat, and has the office of the United States land district.

The Union Pacific railroad crosses the county in the northern portion.

POPULATION AND VALUATION.—TREGO COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	2,610	2,481	\$1,001,275	\$54,582	\$93,536	\$272,322	\$1,421,715
Collyer twp.	514	465	\$244,250	\$6,424	\$4,275	\$76,364	\$331,313
Franklin twp.	141	154	90,590	1,860	.....	.....	92,450
Glencoe twp.	129	139	38,400	2,030	.....	37,152	77,582
Ogallah twp.	499	480	168,500	9,605	3,400	53,320	234,825
Riverside twp.	224	196	100,530	2,982	.....	.....	103,512
Wa Keeney city.	490 } 879	423 } 833	258,495	30,081	85,861	105,485	479,922
Wa Keeney twp.	389 }	410 }	.....	.....	.....	.....	.....
Willcox twp.	224	214	100,510	1,600	.....	.....	102,110

FARM AND CROP STATISTICS.—TREGO COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	27,123	.....	.....	27,358	82,074	\$30,367 38
Spring wheat.....bu.	194	.....	.....	43	.....	.....
Corn.....bu.	13,093	78,558	\$25,138 56	9,084	18,168	7,630 56
Oats.....bu.	3,726	.....	.....	3,357	3,860	1,273 80
Rye.....bu.	2,593	.....	.....	1,344	4,032	1,612 80
Barley.....bu.	3,880	.....	.....	1,947	.....	.....
Buckwheat.....bu.	5	.....	.....	.....	.....	.....
Irish potatoes.....bu.	313	7,825	6,886 00	238	5,950	5,355 00
Sweet potatoes.....bu.	20	1,000	1,000 00	21	525	472 50
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	2,928	.....	36,600 00	3,250	.....	18,525 00
Flax.....bu.	.....	.....	.....	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	324	162,000	4,860 00	215	26,875	806 25
Millet and hungarian.....tons	1,917	2,875	11,500 00	2,419	1,209	6,045 00
Milo maize.....tons	36	72	252 00	6	60	27 00
Kafir corn.....tons	575	863	3,021 00	874	4,370	2,185 00
Jerusalem corn.....tons	96	96	288 00	422	4,220	2,110 00
Timothy.....tons	.....	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	.....	.....	.....
Alfalfa.....tons	7	.....	.....	7	.....	.....
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	.....	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	5,957	2,594	12,970 00	3,872	2,824	11,296 00
Totals.....	62,787	.....	\$102,515 56	54,457	.....	\$87,706 29

Wheat on hand March 1, 1893, 47,391 bushels; March 1, 1894, 13,125 bushels.

Corn on hand March 1, 1893, 49,128 bushels; March 1, 1894, 9,727 bushels.

†Product estimated in tons for 1893; in bushels for 1894.

The general surface is rolling, rough and broken land occurring along the Saline river, in the northern portion. Round Mound, a high elevation in the east-central portion, is a conspicuous landmark, visible for many miles in all directions. Cedar Bluffs, on the Smoky Hill, in the southern portion, extend along the river for a distance of about $1\frac{1}{2}$ miles. Bottom lands vary in width from one-half to one mile, and comprise 12 per cent. of the total area. There are no timber belts, but a few small groves of trees appear along the Saline and other streams. The varieties of native timber found are: White ash, box elder, elm, cottonwood, and hackberry.

A hard stone called "bell rock" is found near the Smoky Hill river, in the southern portion of the county. Magnesian limestone is found in great abundance everywhere, and a very hard conglomerate stone is also found in many places. Native lime exists on nearly every section, and is used in the construction of buildings, being equal to the foreign lime for many purposes. Near the town of Wa Keeney, and in other localities, a superior quality of chalk is found, and is being utilized. Small veins of a very inferior coal, or lignite, exist in both the eastern and western portions, but are not worked. A very fine grade of ocher is mined in large quantities in the cañons of the Saline river, in the northwestern portion of the county, and is shipped to Kansas City.

SUMMARY.—TREGO COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	62,787	\$114,899 56	54,457	\$105,286 29
Animals slaughtered and sold for slaughter.....		71,148 00		28,363 00
Milk sold.....		715 00		180 00
Poultry and eggs sold.....		5,980 00		6,467 00
Wool clip.....lbs.	25,000	4,000 00	26,800	3,484 00
Cheese.....lbs.	2,145	235 95	2,200	264 00
Butter.....lbs.	73,374	11,739 84	68,975	11,036 00
Garden products marketed.....		1,685 00		1,083 00
Horticultural products.....		28 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.	61	61 00	5	5 00
Wood marketed.....				
Totals.....		\$210,492 35		\$156,168 29

LIVE STOCK.—TREGO COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,779	\$144,508 00	2,921	\$96,393 00
Mules and asses.....	180	11,160 00	154	6,468 00
Milch cows.....	1,553	31,060 00	1,419	31,218 00
Other cattle.....	7,034	119,578 00	5,078	91,404 00
Sheep.....	7,776	19,440 00	1,901	4,752 50
Swine.....	685	5,137 50	1,028	7,196 00
Totals.....	20,607	\$330,883 50	12,501	\$237,431 50

* Number of dogs in county March 1, 1893, 413; March 1, 1894, 392.

Number of sheep killed by dogs, year ending March 1, 1894, 8.

WABAUNSEE COUNTY.

It was organized in 1859, while Kansas was yet a territory, contains an area of 804 square miles, and now ranks as the 53d county in population in the state. Alma, west and north of the center, is the county seat. Eskridge and Harveyville, in the southeastern portion of the county, command a large trade in their respective neighborhoods.

POPULATION AND VALUATION.—WABAUNSEE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	11,095	11,170	\$1,668,230	\$424,932	\$140,653	\$560,848	\$2,794,663
Alma city.....	989	1,025					
Alma twp.....	520	569	\$84,610	\$33,875	\$54,039	\$79,629	\$252,153
Farmer twp.....	372	347	106,540	21,630		26,185	154,355
Garfield twp.....	651	583	74,063	22,390	7,001	47,911	151,365
Kaw twp.....	596	651	146,340	40,256			186,596
Maple Hill twp.....	770	767	183,035	60,775	12,703	71,067	327,580
Mill Creek twp.....	656	640	101,726	19,560	670	36,562	158,518
Mission Creek twp.....	1,071	1,027	158,410	26,790		8,558	193,758
Newberry twp.....	1,281	1,390	191,972	42,443	16,415	78,933	329,763
Plumb twp.....	839	799	124,870	34,279	5,563	26,725	191,437
Rock Creek twp.....	705	627	95,700	16,690			112,390
Wabaunsee twp.....	1,043	1,032	196,676	44,755	6,062	120,431	367,924
Washington twp.....	370	364	90,220	21,899		40,827	152,946
Eskridge city.....	503	576					
Wilmington twp.....	729	753	114,068	39,590	38,200	24,020	215,878

FARM AND CROP STATISTICS.—WABAUNSEE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	17,502	161,712	\$72,770 40	12,575	144,864	\$66,637 44
Spring wheat.....bu.	961	6,912	2,764 80	7	60	24 00
Corn.....bu.	89,719	2,512,132	678,275 64	89,894	719,152	316,426 88
Oats.....bu.	10,430	177,310	39,008 20	7,163	78,780	22,846 20
Rye.....bu.	534	5,874	2,055 90	104	1,456	684 32
Barley.....bu.	2			8	136	54 40
Buckwheat.....bu.	52	468	351 00	23	184	110 40
Irish potatoes.....bu.	931	40,964	24,578 40	1,168	70,080	38,544 00
Sweet potatoes.....bu.	237	23,700	23,700 00	479	29,698	14,849 00
Castor beans.....bu.				18	180	180 00
Sorghum.....bu.	776		9,920 00	585		6,690 00
Flax.....bu.	277	2,216	1,883 60	150	1,200	1,200 00
Tobacco.....lbs.	1			1	600	60 00
Broom corn.....lbs.	12	4,800	96 00	8		
Millet and hungarian, tons	5,836	11,672	46,688 00	5,997	8,995	35,980 00
Milo maize.....tons	5	†	70 00	2	40	18 00
Kaffir corn.....tons	209	†	2,926 00	246	4,182	2,091 00
Jerusalem corn.....tons						
Timothy.....tons	4,311			3,163		
Clover.....tons	796			700		
Blue grass.....tons	438			506		
Alfalfa.....tons	1,971	* 7,642	45,852 00	2,334	† 9,970	59,820 00
Orchard grass.....tons	121			17		
Other tame grasses.....tons	290			170		
Prairie grass, fenced.....tons	141,524	39,893	109,705 75	130,554	45,196	180,784 00
Totals.....	276,935		\$1,060,645 69	255,872		\$746,999 64

Wheat on hand March 1, 1893, 92,304 bushels; March 1, 1894, 60,540 bushels.

Corn on hand March 1, 1893, 516,118 bushels; March 1, 1894, 493,773 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The Manhattan, Alma & Burlingame railroad, an adjunct of the Atchison, Topeka & Santa Fé, crosses the county from the southeastern to the northwestern corner. The Chicago, Rock Island & Pacific enters the northeastern portion and leaves the county in the southwestern.

The general surface in the eastern and western portions is a gently undulating prairie; in the southeastern slightly rolling and nearly level, while in the central and northern portions high hills and bluffs occur, adapted particularly to grazing. Bottom lands average one mile in width, and, in the aggregate, comprise 15 per cent. of the total county area. Timber belts along the streams vary from a few rods to one-half mile in width, and contain the following varieties of trees: Walnut, white and bur oak, hickory, cottonwood, ash, red and white em, sycamore, hackberry, coffee bean, mulberry, dogwood, and locust. The Central and West branches of Mill creek, the former having its source in the southwestern portion and the latter coming into the county from the west, meet near the town of Alma and form Mill creek, which stream has a course north of east, and empties into the Kansas river near the northeastern corner.

Limestone underlies the entire county; blue, gray and yellow hard limestone and a soft white magnesian limestone are especially abundant. There are many quarries in operation, the ledges varying from one foot to six feet in thickness. The

SUMMARY.—WABAUNSEE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	276,935	\$1,060,645 69	255,872	\$746,999 64
Animals slaughtered and sold for slaughter.....		591,392 00		877,620 00
Milk sold.....		2,473 00		3,281 00
Poultry and eggs sold.....		37,007 00		41,985 00
Wool clip.....lbs.	4,342	694 72	1,207	156 91
Cheese.....lbs.	500	55 00	7,550	906 00
Butter.....lbs.	298,355	47,736 80	308,087	49,293 92
Garden products marketed.....		2,148 00		16,979 00
Horticultural products.....		1,312 00		5,967 00
Honey and beeswax.....lbs.	6,996	1,264 88	8,455	1,522 02
Wine manufactured.....gals.	4,649	4,649 00	3,922	3,922 00
Wood marketed.....		4,595 00		1,946 00
Totals.....		\$1,753,973 09		\$1,750,578 49

LIVE STOCK.—WABAUNSEE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	11,130	\$578,760 00	10,290	\$339,570 00
Mules and asses.....	652	40,424 00	697	29,274 00
Milch cows.....	9,688	193,760 00	9,700	213,400 00
Other cattle.....	24,023	408,391 00	24,709	444,762 00
Sheep.....	558	1,395 00	79	197 50
Swine.....	18,064	135,480 00	25,331	177,317 00
Totals.....	64,115	\$1,358,210 00	70,806	\$1,204,520 50

Number of dogs in county March 1, 1893, 2,172; March 1, 1894, 1,982.

Number of sheep killed by dogs, year ending March 1, 1894, 2.

Number of sheep killed by wolves, year ending March 1, 1894, 30.

quarries located near the towns of Alma and Eskridge yield vast quantities of valuable material for building purposes, and add largely to the commercial importance of the county. Large quantities of a superior quality of cement have been discovered near Alma, and are classed with the best in the state. It is claimed that mineral paint exists in various portions, but it has not been submitted to chemical tests. Fire clay exists in considerable quantities between Eskridge and Harveyville, and in several other localities. Potters' clay is found from the southeast corner of the county to the center. Coal exists in large quantities near the town of Alma; veins have been discovered, 10 inches, 20 inches, and 40 inches, respectively.

WALLACE COUNTY.

Is on the Colorado border, and the third county south from the Nebraska state line. It was organized in 1888, has an area of 900 square miles, and ranks as the 86th county in population. Sharon Springs, near the center, is the county seat. The Union Pacific railroad crosses the central portion of the county from east to west. The general surface is undulating, rough and broken land occurring along the south side of the Smoky Hill river. Bottom lands vary from one-fourth of a mile to one mile in width. Groves of cottonwood and willow extend along the Smoky Hill river nearly its entire course across the county. Smoky Hill river crosses the center of the county from west to east.

FARM AND CROP STATISTICS.—WALLACE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	24,648	492	\$231 24	21,083	632	\$290 72
Spring wheat.....bu.	3,243	128	51 20	5,077	.....	.....
Corn.....bu.	8,677	17,354	6,073 90	9,244	.....	.....
Oats.....bu.	2,816	.....	.....	2,381	.....	.....
Rye.....bu.	1,610	.....	.....	463	463	208 35
Barley.....bu.	3,773	15,092	7,244 16	1,851	.....	.....
Buckwheat.....bu.	1	.....	.....	7	56	33 60
Irish potatoes.....bu.	126	.....	.....	69	3,450	2,760 00
Sweet potatoes.....bu.	.....	.....	.....	.....	.....	.....
Castor beans.....bu.	.....	.....	.....	.....	.....	.....
Sorghum.....bu.	1,628	.....	12,498 00	2,267	.....	14,160 00
Flax.....bu.	34	102	86 70	.....	.....	.....
Tobacco.....lbs.	.....	.....	.....	.....	.....	.....
Broom corn.....lbs.	3,454	1,036,200	31,086 00	2,331	.....	.....
Millet and hungarian, tons	935	935	1,870 00	1,813	1,813	9,065 00
Milo maize.....tons	34	68	238 00	40	200	90 00
Kafir corn.....tons	956	1,912	6,692 00	825	4,125	2,062 50
Jerusalem corn.....tons	324	324	972 00	227	1,135	567 50
Timothy.....tons	3	.....	.....	.....	.....	.....
Clover.....tons	.....	.....	.....	.....	.....	.....
Blue grass.....tons	.....	.....	.....	11	.....	.....
Alfalfa.....tons	199	106	636 00	111	† 568	3,408 00
Orchard grass.....tons	.....	.....	.....	.....	.....	.....
Other tame grasses.....tons	21	.....	.....	.....	.....	.....
Prairie grass, fenced.....tons	2,750	1,375	7,906 25	3,717	1,604	6,416 00
Totals.....	55,232	.....	\$75,585 45	51,517	.....	\$39,061 67

Wheat on hand March 1, 1893, 13,659 bushels; March 1, 1894, 4,038 bushels.

Corn on hand March 1, 1893, 14,365 bushels; March 1, 1894, 1,532 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

Magnesian limestone and a very hard conglomerate stone are found in many places. Native lime of a superior quality is found, and is extensively used by the inhabitants for building walls and plastering. Gypsum is also found throughout the county, and in some localities crops out in the form of flakes.

POPULATION AND VALUATION.—WALLACE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	2,530	2,483	\$973,521	\$61,887	\$43,527	\$264,034	\$1,342,969
Harrison twp.....	189	263	\$84,800	\$3,353	.....	.....	\$88,153
Morton twp.....	261	271	138,620	4,195	.....	.....	142,815
North twp.....	.....	262	78,200	2,529	.....	.....	80,729
Sharon Springs city, 269 } Sharon Springs twp. 589 }	858	616	177,930	36,022	\$36,872	\$73,606	324,430
Stockholm twp.....	229	212	73,700	4,473	.....	.....	78,173
Wallace twp.....	550	450	196,941	6,845	5,839	80,578	290,203
Weskan twp.....	285	267	168,130	3,568	816	109,850	282,364
Vega twp.....	158	142	55,200	902	.....	.....	56,102

SUMMARY.—WALLACE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	55,232	\$75,585 45	51,517	\$39,061 67
Animals slaughtered and sold for slaughter.....	.....	144,618 00	.....	96,135 00
Milk sold.....	.....	115 00	.....	233 00
Poultry and eggs sold.....	.....	3,409 00	.....	3,088 00
Wool clip.....lbs.	50,700	8,112 00	17,000	2,210 00
Cheese.....lbs.	140	15 40	246	29 52
Butter.....lbs.	50,217	8,034 72	44,420	7,107 20
Garden products marketed.....	.....	192 00	.....	999 00
Horticultural products.....	.....	.....	.....	.....
Honey and beeswax.....lbs.	.....	.....	.....	.....
Wine manufactured.....gals.	.....	.....	.....	.....
Wood marketed.....	.....	.....	.....	28 00
Totals.....	.....	\$240,081 57	.....	\$148,891 39

LIVE STOCK.—WALLACE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	2,059	\$107,068 00	2,639	\$87,087 00
Mules and asses.....	194	12,028 00	175	7,350 00
Milch cows.....	1,179	23,580 00	1,096	24,112 00
Other cattle.....	2,803	47,651 00	2,536	45,648 00
Sheep.....	7,079	17,697 50	703	1,757 50
Swine.....	622	4,665 00	573	4,011 00
Totals.....	13,936	\$212,689 50	7,722	\$169,965 50

Number of dogs in county March 1, 1893, 325; March 1, 1894, 308.

Number of sheep killed by wolves, year ending March 1, 1894, 1.

WASHINGTON COUNTY.

It was organized in 1860. It has an area of 900 square miles, and ranks as the 21st county in population. Washington, lying a little north and east of the center, is the county seat. There are several other towns of importance.

The Union Pacific, Burlington & Missouri River, Missouri Pacific and Chicago, Rock Island & Pacific railroads have their extensions in the county.

The general surface is an undulating prairie, hilly in the west-central part and along some of the streams. The northern half of the county is somewhat more rolling than the southern. Bottom lands average one-half mile in width, and, in the aggregate, comprise 8 per cent. of the county area. Timber belts have an average width of one-fourth of a mile, and contain the following principal varieties of trees: Elm, oak, cottonwood, walnut, box elder, maple, honey locust, ash, and linn. Springs are very numerous in nearly every portion, and well water is reached at depths varying from 20 to 50 feet. The Little Blue river enters the county from the north, 11 miles west of the northeastern corner, and, flowing southeast, crosses the eastern border a little south of the center.

POPULATION AND VALUATION.—WASHINGTON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	21,978	20,408	\$2,602,050	\$412,296	\$365,360	\$641,968	\$4,021,674
Barnes city	296 } 894	367 } 952	\$99,885	\$17,595	\$13,015	\$38,665	\$169,164
Barnes twp.	598 }	585 }	100,950	7,930			108,880
Brantford twp.	684	645	101,130	11,875		33,962	146,910
Charleston twp.	609	603					
Clifton city	344 } 1,115	340 } 821	112,600	22,405	19,160	100,167	254,332
Vining city	133 }	144 }					
Clifton twp.	638 }	337 }					
Coleman twp.	603	593	96,790	7,276	565		104,631
Farmington twp.	685	717	121,020	10,240		12,376	143,636
Hollenberg city	191 } 833	195 } 883	98,540	19,065	6,340	56,226	180,171
Franklin twp.	642 }	688 }					
Grant twp.	765	728	98,560	5,425			103,985
Greenleaf city	899 } 1,496	843 } 1,407	116,315	25,810	69,035	53,966	265,126
Greenleaf twp.	597 }	564 }					
Haddam city	388 } 1,116	344 } 734	107,440	22,770	24,155	30,494	184,859
Haddam twp.	728 }	390 }					
Hanover city	935 } 1,756	905 } 1,711	110,140	35,605	44,995	78,648	269,388
Hanover twp.	821 }	806 }					
Highland twp.	472	448	85,175	6,455			91,630
Independence twp.	773	492	109,920	16,675	2,530	38,045	167,170
Kimeo twp.	607	612	94,590	11,225			105,815
Lincoln twp.	609	571	86,220	9,210			95,430
Linn city	195 } 945	211 } 930	115,435	22,395	9,650	43,710	191,190
Linn twp.	750 }	719 }					
Little Blue twp.	673	607	97,485	10,225			107,710
Logan twp.	604	615	108,355	9,375		16,962	134,692
Lowe twp.	566	601	84,810	8,160			92,970
Mill Creek twp.	697	761	101,170	13,810	4,265	29,566	148,811
Sheridan twp.	685	687	98,400	6,135		45,596	150,131
Palmer city	144 } 836	188 } 693	105,080	25,905	10,075	14,584	155,644
Sherman twp.	692 }	505 }					
Strawberry twp.	649	614	95,535	6,490			102,025
Mahaska city		104 }					
Union twp.		504 }	103,260	17,750	4,875	17,857	143,742
Washington city	1,854 } 2,556	1,629 } 2,375	153,245	62,490	156,700	31,197	403,632
Washington twp.	702 }	746 }					

Limestone and sandstone are found in all portions of the county. Mineral paint is found near the town of Hollenberg, and other portions of the northern half of the county. Clay of a gray-white color, strongly resembling the Dorsetshire clay, from which tobacco pipes are manufactured, has been discovered near the city of Washington. Veins of cement exist, but are not utilized to any extent. Fire clay of excellent quality is found in the northeastern portion of the county. A bed of gypsum, 60 feet in thickness, at a depth of 200 feet, in the northeastern portion; also, a bed 15 feet thick, in Greenleaf township. Salt springs exist in Mill Creek township, and deposits of salt are to be met with in the central and western portions of the county.

FARM AND CROP STATISTICS.—WASHINGTON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	32,741	157,152	\$75,432 96	24,803	295,148	\$132,816 60
Spring wheat.....bu.	368	2,024	910 80	140	.....	.....
Corn.....bu.	169,444	4,066,656	1,016,664 00	181,945	1,273,615	483,973 70
Oats.....bu.	52,519	630,228	126,045 60	42,623	716,064	200,497 92
Rye.....bu.	1,820	18,200	7,644 00	1,365	19,110	8,559 50
Barley.....bu.	86	.....	.....	.....	.....	.....
Buckwheat.....bu.	55	330	247 50	58	464	278 40
Irish potatoes.....bu.	1,549	15,490	15,490 00	1,611	41,886	37,697 40
Sweet potatoes.....bu.	17	850	850 00	12	300	300 00
Castor beans.....bu.	10	50	57 50	.....	.....	.....
Sorghum.....bu.	200	.....	4,450 00	753	.....	5,610 00
Flax.....bu.	1,712	13,696	11,641 60	671	7,381	7,381 00
Tobacco.....lbs.	.....	.....	.....	.....	.....	464 00
Broom corn.....lbs.	232	116,000	3,480 00	58	11,600	.....
Millet and hungarian, tons	6,671	15,009	90,054 00	11,309	11,309	45,236 00
Milo maize.....tons	3	9	32 00	19	380	171 00
Kaffir corn.....tons	53	159	556 00	84	1,680	840 00
Jerusalem corn.....tons	25	75	225 00	12	240	120 00
Timothy.....tons	5,921	} * 6,852	41,112 00	1,737	} † 5,956	35,736 00
Clover.....tons	1,042			109		
Blue grass.....tons	780			495		
Alfalfa.....tons	248			316		
Orchard grass.....tons	71			16		
Other tame grasses.....tons	149	} ‡	119,316 75	158	} 15,544	46,632 00
Prairie grass, fenced..tons	78,284			84,681		
Totals.....	354,000	.....	\$1,514,209 71	352,975	.....	\$1,006,313 52

Wheat on hand March 1, 1893, 142,362 bushels; March 1, 1894, 55,531 bushels.

Corn on hand March 1, 1893, 1,222,803 bushels; March 1, 1894, 819,721 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—WASHINGTON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	354,000	\$1,514,209 71	352,975	\$1,006,313 52
Animals slaughtered and sold for slaughter.....	.....	1,017,699 00	.....	985,024 00
Milk sold.....	.....	9,240 00	.....	2,413 00
Poultry and eggs sold.....	.....	69,957 00	.....	77,874 00
Wool clip.....lbs.	7,500	1,200 00	2,421	314 73
Cheese.....lbs.	3,502	385 22	4,240	508 80
Butter.....lbs.	550,123	88,019 68	572,141	91,542 56
Garden products marketed.....	.....	7,232 00	.....	1,552 00
Horticultural products.....	.....	3,648 00	.....	2,752 00
Honey and beeswax.....lbs.	31,246	5,668 17	11,328	2,041 32
Wine manufactured.....gals.	2,416	2,416 00	504	504 00
Wood marketed.....	.....	9,312 00	.....	1,535 00
Totals.....	.....	\$2,728,986 78	.....	\$2,172,374 93

LIVE STOCK.—WASHINGTON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number	Value.	Number.	Value.
Horses	14,945	\$777,140 00	15,088	\$497,904 00
Mules and asses	1,028	63,736 00	1,071	44,982 00
Milch cows	12,351	247,020 00	11,469	252,318 00
Other cattle	27,823	472,991 00	23,295	419,310 00
Sheep	1,513	3,782 50	1,109	2,772 50
Swine	40,123	300,922 50	52,280	365,960 00
Totals	97,783	\$1,865,592 00	104,312	\$1,583,246 50

Number of dogs in county March 1, 1893, 2,838; March 1, 1894, 3,051.

Number of sheep killed by dogs, year ending March 1, 1894, 5.

Number of sheep killed by wolves, year ending March 1, 1894, 11.

WICHITA COUNTY.

Lies in the extreme west-central portion of the state, there being but one county between it and the state of Colorado. It has an area of 720 square miles, and ranks as the 95th county in population in the state. Leoti, situated nearly in the center, is the county seat.

The Chicago, Kansas & Western, a division of the Atchison, Topeka & Santa Fé railroad, and the Denver, Memphis & Atlantic, western division of the Missouri Pacific, cross the central portion of the county from east to west, nearly parallel.

The general surface is an undulating prairie, bluffs and rough lands occurring along the course of Beaver creek, in the northern portion. Bottom lands average one-half mile in width, and comprise about 3 per cent. of the total area. A few trees—principally cottonwood—are found along the banks of Beaver creek. The county is practically without timber of any description.

A soft conglomerate stone crops out along the Beaver and White Woman creeks, but is not fit for building purposes. Small quantities of chalk have been discovered along Hackberry creek. Gypsum is found in the northern half of the county.

POPULATION AND VALUATION.—WICHITA COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	2,040	1,677	\$586,430	\$31,243	\$64,175	\$253,843	\$935,791
Beaver twp.	214	177	\$49,225	\$3,839	.....	.....	\$53,064
Edwards twp.	610	514	164,175	3,487	.....	.....	167,662
Coronado twp.	198	165	78,175	2,583	\$2,222	\$125,028	208,008
Leoti twp.	473	348	42,917	11,245	60,973	63,055	178,195
Sinn twp.	189	190	61,253	3,060	975	65,760	131,048
Sumner twp.	49	40	25,815	789	.....	.....	26,604
White Woman twp. ..	251	193	138,995	5,031	.....	.....	144,026
Yates twp.	56	50	25,875	1,209	.....	.....	27,084

FARM AND CROP STATISTICS.—WICHITA COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	25,319	3,795	\$1,897 50	41,414	45,554	\$18,221 60
Spring wheat.....bu.	320			196	294	117 60
Corn.....bu.	3,546			3,642		
Oats.....bu.	1,629			1,784	5,352	1,605 60
Rye.....bu.	657			388	1,940	873 00
Barley.....bu.	4,467			6,824	47,768	21,495 60
Buckwheat.....bu.						
Irish potatoes.....bu.	144			52	2,600	2,340 00
Sweet potatoes.....bu.	1			1	50	50 00
Castor beans.....bu.						
Sorghum.....bu.	2,124		15,284 00	3,121		18,725 00
Flax.....bu.				40	120	120 00
Tobacco.....lbs.	1					
Broom corn.....lbs.	232	116,000	2,900 00	204	61,200	1,530 00
Millet and hungarian.....tons	180	90	270 00	74	37	185 00
Milo maize.....tons	8	† 16	56 00	102	510	229 50
Kaffir corn.....tons	534	† 1,068	3,738 00	623	3,115	1,557 50
Jerusalem corn.....tons	532	† 798	2,394 00	741	3,705	1,852 50
Timothy.....tons	6					
Clover.....tons						
Blue grass.....tons						
Alfalfa.....tons	3	* 63	378 00	38	† 156	936 00
Orchard grass.....tons						
Other tame grasses.....tons	10					
Prairie grass, fenced.....tons	3,368	275	1,650 00	8,430	571	2,284 00
Totals.....	43,081		\$28,567 50	67,684		\$72,122 90

Wheat on hand March 1, 1893, 9,460 bushels; March 1, 1894, 40 bushels.

Corn on hand March 1, 1893, 4,015 bushels; March 1, 1894, 519 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—WICHITA COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	43,081	\$28,567 50	67,684	\$72,122 90
Animals slaughtered and sold for slaughter.....		12,806 00		17,181 00
Milk sold.....		108 00		104 00
Poultry and eggs sold.....		2,602 00		2,682 00
Wool clip.....lbs.	6,085	973 60	112	14 56
Cheese.....lbs.	30	3 30	200	24 00
Butter.....lbs.	21,740	3,478 40	19,566	3,130 56
Garden products marketed.....		236 00		430 00
Horticultural products.....		3,600 00		
Honey and beeswax.....lbs.				
Wine manufactured.....gals.				
Wood marketed.....				
Totals.....		\$52,374 80		\$95,689 02

LIVE STOCK.—WICHITA COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	1,209	\$62,868 00	1,745	\$57,585 00
Mules and asses.....	101	6,262 00	115	4,830 00
Milch cows.....	475	9,500 00	703	15,466 00
Other cattle.....	1,090	18,530 00	888	15,984 00
Sheep.....	806	2,015 00	38	95 00
Swine.....	420	3,150 00	367	2,569 00
Totals.....	4,101	\$102,325 00	3,856	\$96,529 00

Number of dogs in county March 1, 1893, 155; March 1, 1894, 210.

WILSON COUNTY.

Was organized in 1865; has an area of 576 square miles, and is the third west from the Missouri border. Rank as the 42d county in the state in population. Fredonia, lying north of Fall river, south and west of the center, is the county seat. Neodesha, in the south-central portion, Buffalo, situated in the northern portion, a little east of the center, Altoona, in the southeastern, New Albany, in the western, and Benedict, a little north of the center, do a large trade in their several localities.

The Atchison, Topeka & Santa Fé, Missouri Pacific and the St. Louis & San Francisco railroads have extensions within its borders.

The general surface of the eastern portion of the county is undulating, with occasional mounds, the central and western uneven, with numerous bluffs, and the north-western interspersed with timbered hills and small cañons. Bottom lands have an average width of one mile, and, in the aggregate, comprise 20 per cent. of the total area. Timber belts along the streams vary from one-third to one-half mile in width, and, together with the groves on the uplands, contain the following varieties of trees: Oak, hickory, walnut, hackberry, red and white elm, soft maple, pecan, coffee bean, sycamore, ash, cherry, linn, mulberry, cottonwood, willow, persimmon, papaw, and cedar. Springs are abundant in all sections of the county, and well water is reached at an average depth of 25 feet. The Verdigris river enters the county on the north, $2\frac{1}{2}$ miles east of the northwestern corner.

Limestone is found at Fredonia, Neodesha, Altoona, Buffalo, Guilford, and Coyville. Quarries exist at all these places, and large quantities of stone are shipped to other counties. A valuable gray-stone quarry is in operation near the town of New Albany. A valuable sandstone exists in both the northern and southern portions, and is used largely in buildings. A good quality of potters' clay is found at Neodesha and Fredonia, and tiling is manufactured from it on an extensive scale. Salt springs are frequently met with when digging for wells. Neodesha, in the southern part, is the center of a very notable oil and natural-gas region, where nearly 100 wells have been sunk, from 800 to 1,000 feet in depth, many of them large producers.

POPULATION AND VALUATION.—WILSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	13,740	14,023	\$1,309,415	\$298,285	\$823,246	\$663,877	\$2,594,823
Altoona city	259 } 918	264 } 864	\$90,342	\$17,625	\$10,236	\$31,974	\$150,177
Cedar twp.	659 }	600 }					
Fredonia city	1,476 } 2,190	1,387 } 2,158	152,956	56,159	174,417	119,487	503,019
Center twp.	714 }	771 }					
Chetopa twp.	645	739	75,975	18,715			94,690
Clifton twp.	657	815	79,806	22,228	11,283	47,013	160,330
Colfax twp.	916	909	87,763	20,420	831	37,340	146,354
Duck Creek twp.	505	448	52,839	8,285	800	26,927	88,851
Fall River twp.	1,114	1,098	124,200	20,585	3,462	49,604	197,851
Guilford twp.	634	562	88,187	17,317	8,885	76,311	190,700
Neodesha city	1,417 }	1,718 }	117,613	48,908	105,254	105,241	377,016
Neodesha twp.	818 }	815 }					
Newark twp.	708	772	71,865	9,813			81,678
Pleasant Valley twp.	847	866	93,225	21,260		19,795	134,280
Prairie twp.	414	366	54,790	7,325		72,106	134,221
Talleyrand twp.	625	644	67,733	10,550	3,409	38,893	120,585
Verdigris twp.	834	763	71,686	9,985	4,669	27,344	113,684
Webster twp.	498	486	80,435	9,110		11,842	101,387

FARM AND CROP STATISTICS.—WILSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	16,769	208,770	\$93,946 50	11,344	195,100	\$76,089 00
Spring wheat.....bu.	49			17		
Corn.....bu.	71,452	1,000,328	300,098 40	73,710	1,105,650	451,316 50
Oats.....bu.	19,841	376,979	75,395 80	18,967	307,675	79,995 50
Rye.....bu.	1,095	14,235	6,121 05	724	11,584	4,633 60
Barley.....bu.	41			108	1,080	486 00
Buckwheat.....bu.				60	480	288 00
Irish potatoes.....bu.	348	13,920	11,414 40	604	27,180	17,938 80
Sweet potatoes.....bu.	4	120	120 00	5	300	240 00
Castor beans.....bu.	184	1,472	1,692 80	371	3,710	3,710 00
Sorghum.....bu.	715		12,930 00	817		10,355 00
Flax.....bu.	7,362	51,534	43,803 90	13,026	91,182	91,182 00
Tobacco.....lbs.						
Broom corn.....lbs.	1,788	894,000	17,880 00	800	480,000	14,400 00
Millet and hungarian, tons	3,828	6,699	26,796 00	3,068	4,602	23,010 00
Milo maize.....tons	37	† 148	518 00	15	300	135 00
Kaffir corn.....tons	123	† 492	1,722 00	502	10,040	5,020 00
Jerusalem corn.....tons	27	† 54	162 00	3	60	30 00
Timothy.....tons	5,506			6,709		
Clover.....tons	1,583			1,348		
Blue grass.....tons	995			900		
Alfalfa.....tons	59	* 4,544	27,264 00	261	† 5,832	34,992 00
Orchard grass.....tons	2			10		
Other tame grasses.....tons	112			128		
Prairie grass, fenced.....tons	59,603	20,857	83,428 00	66,543	25,239	100,956 00
Totals.....	191,523		\$703,292 85	200,040		\$914,777 40

Wheat on hand March 1, 1893, 27,710 bushels; March 1, 1894, 40,468 bushels.

Corn on hand March 1, 1893, 252,467 bushels; March 1, 1894, 115,343 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—WILSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	191,523	\$703,292 85	200,040	\$914,777 40
Animals slaughtered and sold for slaughter.....		428,915 00		583,015 00
Milk sold.....		500 00		460 00
Poultry and eggs sold.....		40,592 00		45,226 00
Wool clip.....lbs.	5,552	888 32	3,928	510 64
Cheese.....lbs.			4,200	504 00
Butter.....lbs.	303,932	48,629 12	345,978	55,356 48
Garden products marketed.....		3,188 00		4,401 00
Horticultural products.....		2,999 00		
Honey and beeswax.....lbs.	13,936	2,510 72	5,862	1,056 00
Wine manufactured.....gals.	193	193 00	176	176 00
Wood marketed.....		569 00		1,039 00
Totals.....		\$1,232,277 01		\$1,606,521 62

LIVE STOCK.—WILSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses.....	7,771	\$404,092 00	9,133	\$301,389 00
Mules and asses.....	1,207	74,834 00	1,515	63,630 00
Milch cows.....	5,565	111,300 00	6,251	137,522 00
Other cattle.....	13,845	235,365 00	14,238	256,284 00
Sheep.....	466	1,165 00	494	1,235 00
Swine.....	14,151	106,132 50	20,943	146,601 00
Totals.....	43,005	\$932,888 50	52,574	\$906,661 00

Number of dogs in county March 1, 1893, 1,666; March 1, 1894, 1,887.

WOODSON COUNTY.

Organized in 1855; has an area of 504 square miles; ranks as the 62d county in number of inhabitants. Yates Center, near the center, is the county seat. The towns of Toronto and Neosho Falls are important places to the surrounding country.

The Atchison, Topeka & Santa Fé and the Missouri Pacific railroads have extensions in the county.

POPULATION AND VALUATION.—WOODSON COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county.....	8,545	8,975	\$1,323,758	\$257,430	\$264,100	\$460,811	\$2,306,099
Belmont twp.....	563	607	\$111,073	\$19,555	.....	.....	\$130,628
Yates Center city.....	1,420	1,626	184,540	59,101	\$162,180	\$131,615	537,436
Center twp.....	536	549	100,020	18,585	.....	30,678	149,283
Eminence twp.....	437	400	132,462	19,622	807	93,089	245,980
Everett twp.....	736	740	152,021	20,840	.....	6,635	179,496
Liberty twp.....	802	814	128,905	28,994	65,157	94,074	317,130
Neosho Falls city.....	566	542	144,255	19,195	.....	.....	163,450
Neosho Falls twp.....	669	668	135,295	24,128	.....	30,981	190,404
North twp.....	420	444	74,220	8,155	.....	.....	82,375
Owl Creek twp.....	684	712	160,967	39,255	35,956	73,739	309,917
Perry twp.....	453	487	.....	.....	.....	.....	.....
Toronto city.....	569	595	.....	.....	.....	.....	.....
Toronto twp.....	690	791	.....	.....	.....	.....	.....

FARM AND CROP STATISTICS.—WOODSON COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	3,174	44,778	\$20,597 88	1,469	27,456	\$11,806 06
Spring wheat.....bu.	5	.....	.....	17	.....	.....
Corn.....bu.	50,583	708,162	198,285 36	47,854	1,004,934	412,022 94
Oats.....bu.	14,052	295,092	59,018 40	10,343	232,700	65,156 00
Rye.....bu.	213	4,047	1,821 15	247	6,175	2,778 75
Barley.....bu.	52	.....	.....	.....	.....	.....
Buckwheat.....bu.	1	6	4 50	8	64	38 40
Irish potatoes.....bu.	466	8,640	13,980 00	826	66,080	40,969 60
Sweet potatoes.....bu.	6	450	450 00	8	1,200	744 00
Castor beans.....bu.	70	420	483 00	52	520	520 00
Sorghum.....bu.	376	.....	11,006 00	368	.....	9,292 00
Flax.....bu.	6,327	37,962	32,267 70	4,415	35,320	35,320 00
Tobacco.....lbs.	3	.....	.....	2	2,400	240 00
Broom corn.....lbs.	213	106,500	3,195 00	120	.....	.....
Millet and hungarian, tons	2,983	4,474	17,896 00	2,701	5,402	21,608 00
Milo maize.....tons	10	†	140 00	85	1,700	765 00
Kaffir corn.....tons	654	† 2,616	9,156 00	877	17,540	8,770 00
Jerusalem corn.....tons	16	† 32	96 00	142	3,550	1,775 00
Timothy.....tons	1,988	.....	.....	3,074	.....	.....
Clover.....tons	517	.....	.....	509	.....	.....
Blue grass.....tons	627	* 3,434	20,604 00	413	† 3,232	19,392 00
Alfalfa.....tons	50	.....	.....	100	.....	.....
Orchard grass.....tons	19	.....	.....	49	.....	.....
Other tame grasses.....tons	101	.....	.....	374	.....	.....
Prairie grass, fenced.....tons	78,806	45,412	136,236 00	72,780	45,698	137,094 00
Totals.....	161,312	.....	\$525,236 99	146,833	.....	\$768,291 77

Wheat on hand March 1, 1893, 916 bushels; March 1, 1894, 11,682 bushels.

Corn on hand March 1, 1893, 200,666 bushels; March 1, 1894, 123,528 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

The general surface is a gently rolling prairie, with the central portion somewhat hilly. Bottom lands average a width of $1\frac{1}{2}$ miles, and, in the aggregate, comprise 10 per cent. of the total area. Timber belts, lying along the streams, are from one-fourth to one mile in width, and contain the following varieties of trees: Oak, hickory, black walnut, hackberry, honey locust, pecan, elm, sycamore, cottonwood, ash, box elder, and maple. But few good springs exist, and well water is reached at depths varying from 20 to 40 feet. The Neosho river crosses the extreme north-eastern corner, from northwest to southeast. The Verdigris river, with a south-eastern course, crosses the southwestern corner.

Sandstone and limestone exist in all portions of the county. Near Yates Center extensive quarries of the former are being worked, and large quantities of this stone, of superior quality, are shipped. Fire clay is found north and west of Neosho Falls, and brick is made on an extensive scale at the last-named point. Potters' clay exists in Owl Creek township, near the mouth of South Owl creek. Thin veins of coal have been found in Everett, Center, Toronto and Belmont townships, and are mined to a limited extent.

SUMMARY.—WOODSON COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	161,312	\$525,236 99	146,833	\$768,291 77
Animals slaughtered and sold for slaughter.....		254,965 00		247,682 00
Milk sold.....		1,184 00		299 00
Poultry and eggs sold.....		17,749 00		23,596 00
Wool clip.....lbs.	92,010	14,721 60	81,632	10,612 16
Cheese.....lbs.	9,170	1,008 70	8,370	1,004 40
Butter.....lbs.	176,100	28,176 00	211,936	33,909 76
Garden products marketed.....		3,295 00		3,323 00
Horticultural products.....		723 00		862 00
Honey and beeswax.....lbs.	6,063	1,094 91	3,284	592 62
Wine manufactured.....gals.	72	72 00	251	251 00
Wood marketed.....		744 00		1,405 00
Totals.....		\$848,970 70		\$1,091,828 71

LIVE STOCK.—WOODSON COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

Live stock.	1894.		1893.	
	Number.	Value.	Number.	Value.
Horses.....	6,458	\$335,816 00	6,816	\$224,928 00
Mules and asses.....	648	40,176 00	620	26,040 00
Milch cows.....	4,522	90,440 00	4,796	105,512 00
Other cattle.....	12,540	213,180 00	11,675	210,150 00
Sheep.....	10,460	26,150 00	9,238	23,095 00
Swine.....	7,588	56,910 00	8,848	619,936 00
Totals.....	42,216	\$762,672 00	41,993	\$651,661 00

Number of dogs in county, March 1, 1893, 1,298; March 1, 1894, 1,174.

Number of sheep killed by dogs, year ending March 1, 1894, 13.

Number of sheep killed by wolves, year ending March 1, 1894, 22.

WYANDOTTE COUNTY.

Is situated at the confluence of the Missouri and Kansas (Kaw) rivers, in the extreme eastern portion of the state. It was organized in 1859, under the territorial government, contains an area of 153 square miles, and ranks as the first county in population. Kansas City, lying in the extreme eastern portion of the county, and at the mouth of the Kansas river, is the county seat. At this point are located the second largest live-stock market and packing houses in the world, railroad shops, and the largest grain-receiving market in the West, all furnishing employment to vast numbers of workmen. In the city of Argentine is one of the most extensive silver, lead and gold-smelting establishments in existence, and the city also contains the principal shops and rolling-stock headquarters of the Atchison, Topeka & Santa Fé railway system.

The Atchison, Topeka & Santa Fé, Union Pacific, Chicago, Rock Island & Pacific, Missouri Pacific and Kansas City, Fort Scott & Memphis railroads all have their extensions in the county.

The general surface of the county is undulating, high bluffs occurring along the Missouri and the south bank of the Kansas river. Bottom lands vary in width from one to two miles, and, in the aggregate, comprise 20 per cent. of the total area. There is considerable timber in all sections except the northern, comprising about one-fourth of the area of the county. The belts along the streams average a width of two miles. All the varieties of trees common to the western country are found here. Springs are abundant, and good well water is found at an average depth of 35 feet. The Missouri river, flowing in a southeastern direction, forms the largest portion of the northern boundary, and a small part of the eastern. The Kansas river, with a northeastern course, forms about one-third of the southern boundary, and flows into the Missouri river.

Fine mineral springs of valuable medicinal properties have been discovered at Rosedale, Bonner Springs, and White Church, and attract visitors seeking health.

Indications for the development of coal mining are excellent.

A light-colored limestone, making a good caustic lime, is very abundant on the banks of the Missouri and Kansas rivers, and along the many small streams throughout the county. It is the stone most used for building purposes. A blue limestone, also making a fair quality of lime, is found in limited quantities. It is a hard, compact stone, without seams, and much sought after for "range" work. A gray lime-

POPULATION AND VALUATION.—WYANDOTTE COUNTY.

Table showing the population for 1893 and 1894, and the assessed valuation of the municipal townships and cities in March, 1894.

Townships and cities.	Population.		Assessed valuation of property.				
	1893.	1894.	Land.	Personal.	City lots.	Railroad.	Total.
The county	56,840	56,722	\$3,439,740	\$768,590	\$5,729,815	\$1,307,910	\$11,246,055
Delaware twp.	1,942	1,640	\$193,720	\$13,190	\$24,430	\$120,935	\$352,275
Prairie twp.	956	949	176,380	9,095	8,935	94,330	288,740
Quindaro twp.	1,501	1,747	343,620	9,690	13,835	189,285	556,430
Rosedale city.	1,947	1,969					
Argentine city.	5,242	3,559	560,275	50,640	702,040	338,230	1,651,185
Shawnee twp.	1,390	1,635					
Kansas City.	41,755	42,646	2,165,745	685,975	4,980,575	565,130	8,397,425
Wyandotte twp.	2,107	2,577					

stone, or "granite limestone," making a very inferior lime, is found in immense layers, two to four feet in thickness. It is without flaws, is hard, compact, and durable, and is much used in the construction of bridge piers, abutments, and heavy walls. Limestone, oolitic, is found in beds of great thickness, and is used for abutments, piers, and heavy walls. It makes a poor quality of lime. Sandstone, not very compact, is found in the central and most elevated portions of the county, and is used to a small extent in building. At Argentine and Edwardsville there are ledges of very hard sandstone, similar to the Medina sandstone of New York. Blocks

FARM AND CROP STATISTICS.—WYANDOTTE COUNTY.

Table showing acres, product and value of field crops in the county for 1893 and 1894.

Crops.	1893.			1894.		
	Acres.	Product.	Value.	Acres.	Product.	Value.
Winter wheat.....bu.	9,053	119,490	\$64,524 60	7,265	111,146	\$52,238 62
Spring wheat.....bu.				91		
Corn.....bu.	12,395	433,825	130,147 50	12,038	385,216	165,642 88
Oats.....bu.	1,951	68,285	17,071 25	2,408	67,410	24,941 70
Rye.....bu.	69	1,518	576 84	120	3,120	1,466 40
Barley.....bu.						
Buckwheat.....bu.						
Irish potatoes.....bu.	4,239	317,925	158,962 50	8,135	650,800	533,656 00
Sweet potatoes.....bu.	314	47,100	47,100 00	472	59,000	30,680 00
Castor beans.....bu.						
Sorghum.....bu.	69		2,760 00	22		880 00
Flax.....bu.						
Tobacco.....lbs.						
Broom corn.....lbs.						
Millet and hungarian, tons	59	147	882 00	91	228	1,140 00
Milo malze.....tons						
Kaffir corn.....tons						
Jerusalem corn.....tons						
Timothy.....tons	4,404	* 4,822	28,932 00	5,119	† 4,036	24,216 00
Clover.....tons	1,484			1,239		
Blue grass.....tons	3,333			1,884		
Alfalfa.....tons	31			9		
Orchard grass.....tons	132			142		
Other tame grasses.....tons	990		1,760	1,760		
Prairie grass, fenced.....tons	157	40	230 00	2	40	280 00
Totals.....	38,680		\$451,186 69	40,797		\$835,141 60

Wheat on hand March 1, 1893, 45,756 bushels; March 1, 1894, 23,260 bushels.

Corn on hand March 1, 1893, 73,038 bushels; March 1, 1894, 59,350 bushels.

*Product of 1892. †Product of 1893. ‡Product estimated in tons for 1893; in bushels for 1894.

SUMMARY.—WYANDOTTE COUNTY.

Showing the quantity and value of farm products for the years ending March 1, 1893, and March 1, 1894.

Products.	1893.		1894.	
	Quantity.	Value.	Quantity.	Value.
Field crops.....acres	38,680	\$451,186 69	40,797	\$835,141 60
Animals slaughtered and sold for slaughter.....		98,128 00		52,176 00
Milk sold.....		16,161 00		19,990 00
Poultry and eggs sold.....		12,478 00		8,169 00
Wool clip.....lbs.				
Cheese.....lbs.			800	96 00
Butter.....lbs.	121,685	19,469 60	133,991	21,438 56
Garden products marketed.....		113,955 00		146,170 00
Horticultural products.....		54,259 00		48,295 00
Honey and beeswax.....lbs.	2,089	382 18	992	178 56
Wine manufactured.....gals.	4,752	4,752 00	4,103	4,103 00
Wood marketed.....		2,872 00		2,736 00
Totals.....		\$773,643 47		\$1,138,493 72

of it are used for street paving. Cement rock is found underlying a few hundred acres of land just south of the city limits of Kansas City. It is almost an inexhaustible deposit of hydraulic limestone, from 8 to 15 feet in thickness. The quality is proving to be excellent. A company having a large capital has built costly kilns and a cement mill, and has been manufacturing cement from this stone for the last six years. Under the cement a large deposit of fire clay is found. Fire bricks have been manufactured from it, and the clay is much used as a mortar in laying fire brick. A clay exists, also, in great abundance, from which aluminum is made largely and successfully at Turner.

LIVE STOCK.—WYANDOTTE COUNTY.

Table showing the numbers returned by assessors in March, and values given by correspondents in October, for 1893 and 1894.

<i>Live stock.</i>	1893.		1894.	
	Number.	Value.	Number.	Value.
Horses	2,649	\$137,748 00	2,953	\$97,449 00
Mules and asses	446	27,652 00	474	9,908 00
Milch cows	1,904	38,080 00	2,099	46,178 00
Other cattle	2,313	39,321 00	2,737	49,266 00
Sheep	563	1,407 50	300	750 00
Swine	5,518	41,385 00	5,893	41,251 00
Totals	13,393	\$285,593 50	14,456	\$254,802 00

Number of dogs in county March 1, 1893, 990; March 1, 1894, 986.

ASSESSED VALUATION.

DIAGRAM showing the assessed valuation of the different classes of property for the years given, as per abstracts of county clerks.

1861	\$24,737,459.09		
1870	LANDS, \$48,783,905.75	PERSONAL, \$26,601,455.94	CITY LOTS, \$16,260,506.64
	\$91,645,868.33		
1875	LANDS, \$71,926,233.10	PERSONAL, \$19,422,687.25	CITY LOTS, \$17,917,541.85
	\$121,544,344.07		
1880	LANDS, \$87,179,101.93	PERSONAL, \$31,921,835.	CITY LOTS, \$20,922,921.01
	\$160,570,761.43		
1885	LANDS, \$122,871,339.23	PERSONAL, \$56,502,133.27	CITY LOTS, \$38,420,301.95
	\$248,161,592.27		
1890	LANDS, \$168,285,199.17	PERSONAL, \$48,750,913.38	CITY LOTS, \$72,814,873.70
	\$347,717,218.82		
1894	LANDS, \$173,075,265	PERSONAL, \$40,854,934	CITY LOTS, \$61,835,141
	\$335,530,023		

ASSESSED VALUATION.

TABLE showing the taxable property of the state, by counties, for 1894, as per abstracts of the county clerks; also county totals, as fixed by the state board of equalization.

COUNTIES.	Land.	Town lots.	Personal.	Railroad.	Total valuation of all property, as returned by county clerks.	Total valuation of all property, as fixed by board of equalization.
Allen.....	\$2,066,127 00	\$322,525 00	\$434,327 00	\$554,417 63	\$3,377,396 63	\$3,006,869 00
Anderson.....	1,854,339 00	382,234 00	708,535 00	748,228 25	3,693,336 25	3,928,944 00
Atchison.....	1,694,900 00	1,679,760 00	687,770 00	839,440 00	4,901,870 00	5,633,107 00
Barber.....	2,002,286 00	246,043 00	192,821 00	248,104 44	2,689,254 19	2,616,020 00
Barton.....	1,319,212 00	297,639 00	312,403 00	753,278 00	2,682,532 00	2,991,212 00
Bourbon.....	2,349,874 00	1,605,914 00	861,348 00	1,073,607 91	5,890,743 91	6,131,600 00
Brown.....	2,677,065 00	745,070 00	908,009 00	776,960 22	5,107,104 22	5,107,104 00
Butler.....	2,878,109 00	609,068 00	498,875 00	1,101,181 96	5,088,233 96	6,005,255 00
Chase.....	1,676,638 00	166,034 00	468,892 00	527,649 38	2,829,213 38	3,607,322 00
Chautauqua.....	1,122,853 00	160,051 00	337,368 00	446,820 40	2,067,092 40	2,591,146 00
Cherokee.....	2,009,156 00	679,776 00	402,660 00	791,575 69	3,883,168 44	3,883,168 00
Cheyenne.....	998,520 00	80,736 00	101,700 00	102,108 25	1,283,064 25	787,063 00
Clark.....	767,971 00	64,389 00	81,948 00	186,960 20	1,101,268 20	1,037,267 00
Clay.....	1,849,774 00	369,108 00	588,490 00	575,361 29	3,382,733 29	3,607,322 00
Cloud.....	2,196,692 00	518,992 00	396,453 00	725,834 00	3,837,971 00	3,837,971 00
Coffey.....	2,046,479 00	376,476 00	418,177 00	627,944 73	3,469,076 73	3,781,600 00
Comanche.....	783,853 00	32,789 00	22,782 00	131,420 60	970,844 60	836,537 00
Cowley.....	2,425,263 00	1,500,699 00	729,300 00	1,278,141 39	5,933,403 39	6,492,034 00
Crawford.....	2,182,792 00	1,138,504 00	534,567 00	1,437,138 00	5,293,001 00	5,370,118 00
Decatur.....	1,391,675 00	178,897 00	266,148 00	317,646 93	2,154,366 93	1,695,186 00
Dickinson.....	2,402,647 00	630,649 00	746,199 00	1,014,668 19	4,794,163 19	5,058,727 00
Doniphan.....	1,221,066 00	190,291 00	779,745 00	631,880 00	2,822,982 00	3,546,045 00
Douglas.....	1,850,303 00	1,420,803 00	787,325 00	696,800 00	4,755,231 00	5,079,903 00
Edwards.....	947,607 00	156,955 00	42,425 00	324,925 84	1,471,912 84	1,380,154 00
Elk.....	1,398,581 00	258,175 00	352,002 00	413,229 14	2,421,987 14	2,663,088 00
Ellis.....	959,928 00	197,396 00	128,510 00	292,894 23	1,578,728 23	1,630,161 00
Ellsworth.....	1,541,930 00	322,213 00	255,000 00	570,814 19	2,689,957 19	2,944,254 00
Finney.....	920,172 00	265,149 00	118,445 00	293,829 44	1,597,595 44	1,388,993 00
Ford.....	1,131,298 00	310,797 00	70,042 00	681,243 49	2,193,380 49	1,860,710 00
Franklin.....	2,295,430 00	984,891 00	886,328 00	773,862 68	4,940,511 68	4,940,511 00
Geary.....	969,424 00	537,705 00	274,633 00	354,314 70	2,136,076 70	2,367,705 00
Gove.....	736,339 00	38,193 00	40,598 00	304,725 84	1,119,855 84	1,065,812 00
Graham.....	1,278,793 00	92,176 00	49,808 00	158,231 92	1,579,008 93	968,074 00
Grant.....	568,380 00	3,891 00	13,139 00	.....	585,510 00	245,915 00
Gray.....	600,131 00	37,850 00	26,437 00	284,397 00	948,815 80	842,609 00
Greeley.....	684,030 00	26,614 00	24,340 00	157,029 11	892,013 11	539,221 00
Greenwood.....	2,025,811 00	318,719 00	773,563 00	886,106 62	4,004,199 62	4,783,722 00
Hamilton.....	765,166 00	64,191 00	46,355 00	339,282 79	1,214,994 79	864,710 00
Harper.....	1,491,047 00	368,111 00	193,302 00	615,696 52	2,668,156 52	3,099,172 00
Harvey.....	1,710,886 00	1,062,944 00	450,900 00	829,280 97	4,054,010 97	4,054,010 00
Haskell.....	385,385 00	10,281 00	11,300 00	.....	404,966 00	264,439 00
Hodgeman.....	1,094,106 00	4,810 00	28,668 00	102,112 10	1,289,696 10	779,035 00
Jackson.....	2,279,813 00	397,621 00	627,040 00	609,300 39	3,913,717 39	3,847,685 00
Jefferson.....	2,457,607 00	300,130 00	440,869 00	841,859 00	4,040,465 00	4,104,437 00
Jewell.....	2,422,433 00	217,511 00	420,004 00	451,206 97	3,511,154 97	3,725,350 00
Johnson.....	2,205,927 00	410,414 00	543,911 00	1,012,431 83	4,172,683 83	4,393,900 00
Kearny.....	626,231 00	29,309 00	40,463 00	298,884 18	994,887 18	800,007 00
Kingman.....	1,686,654 00	327,886 00	164,519 00	640,973 53	2,820,032 53	2,928,985 00
Kiowa.....	989,277 00	59,409 00	72,847 00	347,750 40	1,469,283 40	1,256,192 00
Labette.....	1,584,724 00	967,370 00	381,130 00	1,133,887 61	4,067,111 61	4,947,078 00
Lane.....	528,709 00	37,947 00	41,889 00	255,431 88	863,976 88	839,635 00
Leavenworth.....	2,432,580 00	4,678,560 00	1,160,841 00	1,119,457 80	9,391,428 80	9,805,226 00
Lincoln.....	1,702,084 00	220,660 00	529,981 00	195,095 00	2,647,890 00	2,476,198 00
Linn.....	2,128,212 00	338,517 00	567,755 00	644,646 98	3,679,130 93	3,830,854 00
Logan.....	941,490 00	55,971 00	52,970 00	331,153 82	1,381,584 82	1,066,455 00
Lyon.....	3,394,909 00	1,819,056 00	1,317,653 00	874,859 96	7,406,477 96	6,883,948 00
Marion.....	2,307,865 00	632,499 00	438,710 00	909,484 00	4,188,558 00	4,582,046 00
Marshall.....	2,679,918 00	496,613 00	561,584 00	795,055 00	4,533,170 00	5,056,506 00
McPherson.....	2,527,078 00	611,386 00	710,647 00	671,193 37	4,520,304 37	4,635,777 00
Meade.....	734,895 00	75,973 00	37,274 00	172,668 48	1,020,810 48	869,145 00

ASSESSED VALUATION—CONCLUDED.

COUNTIES.	Land.	Town lots.	Personal.	Railroad.	Total valuation of all property, as returned by county clerks.	Total valuation of all property, as fixed by board of equalization.
Miami	\$2,434,986 00	\$628,600 00	\$899,719 00	\$785,450 16	\$4,748,755 16	\$5,065,819 00
Mitchell	2,080,885 00	529,227 00	371,193 00	292,070 75	3,273,375 75	3,151,123 00
Montgomery..	1,671,557 00	756,721 00	414,926 00	942,964 72	3,786,168 72	4,326,376 00
Morris	1,446,480 00	324,648 00	415,346 00	664,927 14	2,851,401 14	3,485,478 00
Morton	598,645 00	51,239 00	21,749 00	.....	671,633 00	335,817 00
Nemaha	3,168,241 00	394,633 00	852,808 00	659,228 71	5,074,910 71	4,986,597 00
Neosho	1,651,822 00	442,327 00	261,387 00	911,339 42	3,266,875 42	3,737,982 00
Ness	1,101,304 00	116,658 00	104,429 00	396,027 27	1,718,418 27	1,308,477 00
Norton	1,631,533 00	216,658 00	319,540 00	505,967 44	2,673,700 30	2,218,476 00
Osage	1,882,649 00	563,130 00	689,291 00	1,091,529 26	4,226,599 26	5,167,120 00
Osborne	1,782,450 00	258,898 00	375,689 00	251,357 94	2,668,394 94	2,571,713 00
Ottawa	1,556,230 00	310,960 00	366,931 00	409,191 18	2,643,312 18	3,179,501 00
Pawnee	1,429,215 00	437,119 00	203,030 00	459,985 00	2,529,399 00	2,115,469 00
Phillips	1,873,094 00	249,859 00	403,701 00	462,200 00	2,988,854 00	2,609,856 00
Pottawatomie,	2,554,610 00	416,145 00	764,466 00	527,940 30	4,263,161 30	4,674,035 00
Pratt	1,512,188 00	242,459 00	240,065 00	510,200 51	2,504,910 51	2,405,175 00
Rawlins	1,267,205 00	84,344 00	138,340 00	177,829 45	1,667,718 45	1,205,853 00
Reno	2,851,378 00	1,149,586 00	494,215 00	1,270,678 67	5,765,857 67	4,956,725 00
Republic	1,724,683 00	257,191 00	368,839 00	872,340 00	3,223,053 00	3,246,560 00
Rice	1,471,152 00	524,466 00	291,946 00	939,900 97	3,227,464 97	3,021,584 00
Riley	1,848,149 00	500,675 00	459,028 00	716,643 15	3,524,495 15	3,271,789 00
Rooks	1,478,669 00	229,606 00	176,159 00	252,810 47	2,137,244 47	1,911,112 00
Rush	1,228,342 00	92,311 00	95,588 00	332,159 44	1,748,401 44	1,535,965 00
Russell	978,065 00	151,786 00	227,292 00	414,094 94	1,771,237 94	2,408,194 00
Saline	1,605,637 00	883,846 00	590,769 00	1,013,320 00	4,093,070 00	4,703,022 00
Scott	661,329 00	58,266 00	34,793 00	259,021 35	1,013,409 35	870,076 00
Sedgwick	3,944,961 00	4,445,146 00	1,243,661 00	1,386,420 00	11,020,188 00	10,442,162 00
Seward	553,592 00	21,949 00	39,014 00	160,536 00	775,089 00	516,977 00
Shawnee	3,956,485 00	8,664,785 00	2,397,410 00	1,290,907 81	16,309,587 81	15,558,653 00
Sheridan	891,730 00	37,001 00	81,002 00	250,836 94	1,260,569 94	1,088,914 00
Sherman	880,808 00	123,349 00	97,336 00	278,688 90	1,410,181 90	1,183,883 00
Smith	2,016,635 00	190,045 00	676,700 00	332,377 00	3,215,757 00	3,129,256 00
Stafford	1,385,116 00	155,780 00	245,225 00	334,939 60	2,121,160 60	2,085,338 00
Stanton	413,310 00	20,131 00	20,095 00	.....	453,527 00	312,934 00
Stevens	794,577 00	20,347 00	8,525 00	.....	823,449 00	296,442 00
Sumner	3,729,468 00	1,028,351 00	814,530 00	1,474,290 00	7,046,539 00	6,712,205 00
Thomas	1,212,219 00	119,059 00	88,388 00	472,309 76	1,891,976 26	1,537,060 00
Trego	1,001,275 00	93,536 00	54,582 00	272,322 98	1,421,715 98	973,452 00
Wabunsee	1,668,230 00	140,653 00	424,932 00	560,848 00	2,794,663 00	3,889,232 00
Wallace	973,521 00	43,527 00	61,887 00	264,034 15	1,342,969 15	835,870 00
Washington..	2,602,050 00	365,360 00	402,296 00	641,969 23	4,021,675 23	4,325,848 00
Wichita	586,430 00	64,175 00	31,243 00	253,841 80	935,689 80	765,227 00
Wilson	1,309,415 00	323,246 00	298,285 00	663,877 16	2,594,823 16	3,270,654 00
Woodson	1,323,758 00	264,100 00	257,430 00	460,810 32	2,306,098 32	2,176,928 00
Wyandotte	3,439,740 00	5,729,815 00	768,590 00	1,307,917 00	11,246,055 00	11,246,055 00
Totals	\$173,075,265 00	\$61,835,141 00	\$40,854,934 00	\$59,764,683 23	\$335,530,023 23	\$337,496,120 00

COMMON SCHOOLS.

TABLE showing number of organized school districts in each county and population between 5 and 21 years of age, for the year 1894.

COUNTIES.	Number of organized districts in the county.....	POPULATION BETWEEN 5 AND 21 YEARS.						Total.
		Males.			Females.			
		White.	Col-ored.	Total.	White.	Col-ored.	Total.	
Allen.....	83	2,486	44	2,530	2,312	47	2,359	4,889
Anderson.....	97	2,592	74	2,666	2,469	66	2,535	5,201
Atchison.....	77	3,723	648	4,371	3,606	643	4,249	8,620
Barber.....	94	1,066	4	1,070	991	3	994	2,064
Barton.....	101	2,550	78	2,628	2,454	75	2,529	5,157
Bourbon.....	110	5,599	402	6,001	5,722	474	6,196	12,197
Brown.....	82	3,478	79	3,557	3,370	78	3,448	7,005
Butler.....	166	4,193	11	4,204	4,126	4	4,130	8,334
Chase.....	64	1,337	30	1,367	1,311	20	1,331	2,698
Chautauqua.....	99	2,237	20	2,257	2,128	19	2,147	4,404
Cherokee.....	103	5,026	220	5,246	4,688	178	4,866	10,112
Cheyenne.....	75	868	.....	868	802	.....	802	1,670
Clark.....	51	301	.....	301	230	.....	230	531
Clay.....	106	2,999	.....	2,999	2,852	.....	2,852	5,851
Cloud.....	112	3,358	4	3,362	3,411	4	3,415	6,777
Coffey.....	96	2,860	29	2,889	2,738	28	2,766	5,655
Comanche.....	55	274	.....	274	250	.....	250	524
Cowley.....	151	5,543	93	5,636	5,077	107	5,184	10,820
Crawford.....	122	5,763	189	5,952	5,733	178	5,911	11,863
Decatur.....	108	1,588	.....	1,588	1,590	.....	1,590	3,178
Dickinson.....	121	4,283	3	4,286	3,778	5	3,783	8,069
Doniphan.....	69	2,411	135	2,546	2,141	126	2,267	4,813
Douglas.....	85	3,421	575	3,996	3,325	567	3,892	7,888
Edwards.....	42	649	10	659	632	8	640	1,299
Elk.....	89	2,135	.....	2,135	2,028	.....	2,028	4,163
Ellis.....	56	1,626	15	1,641	1,543	24	1,567	3,208
Ellsworth.....	76	1,757	33	1,790	1,712	22	1,734	3,524
Finney.....	63	660	5	665	640	15	655	1,320
Ford.....	61	886	3	889	884	3	887	1,776
Franklin.....	96	3,627	162	3,789	3,304	176	3,480	7,269
Geary.....	44	1,543	.....	1,543	1,757	.....	1,757	3,300
Gove.....	49	464	12	476	402	9	411	887
Graham.....	83	759	89	848	707	72	779	1,627
Grant.....	36	129	7	136	116	8	124	260
Gray.....	43	327	1	328	268	2	270	598
Greeley.....	25	216	.....	216	222	.....	222	438
Greenwood.....	114	2,851	4	2,855	2,712	4	2,716	5,571
Hamilton.....	28	244	10	254	250	9	259	513
Harper.....	87	1,935	.....	1,935	1,883	.....	1,883	3,818
Harvey.....	73	3,261	.....	3,261	3,009	.....	3,009	6,270
Haskell.....	34	111	.....	111	154	.....	154	265
Hodgeman.....	53	336	34	370	357	40	397	767
Jackson.....	85	2,703	33	2,736	2,513	45	2,558	5,294
Jefferson.....	99	3,120	135	3,255	2,994	130	3,124	6,379
Jewell.....	163	3,607	.....	3,607	3,511	.....	3,511	7,118
Johnson.....	97	3,241	167	3,408	2,634	147	2,781	6,189
Kearny.....	22	211	.....	211	189	.....	189	400
Kingman.....	98	1,926	16	1,942	1,824	13	1,837	3,779
Kiowa.....	53	499	6	505	430	2	432	937
Labette.....	111	4,008	315	4,323	4,063	351	4,414	8,737
Lane.....	49	345	.....	345	331	.....	331	676
Leavenworth.....	78	5,498	705	6,203	5,475	813	6,288	12,491
Lincoln.....	89	1,945	8	1,973	1,782	7	1,789	3,742
Linn.....	101	2,932	80	3,012	2,799	54	2,853	5,865
Logan.....	49	416	.....	416	389	.....	389	805

COMMON SCHOOLS—CONCLUDED.

COUNTIES.	Number of organized districts in the county.....	POPULATION BETWEEN 5 AND 21 YEARS.						Total.
		Males.			Females.			
		White.	Col-ored.	Total.	White.	Col-ored.	Total.	
Lyon.....	114	4,140	155	4,395	4,033	158	4,191	8,486
Marion.....	123	4,006	22	4,028	3,731	27	3,758	7,786
Marshall.....	142	4,483	61	4,544	4,146	57	4,203	8,747
McPherson.....	121	3,911	.....	3,911	3,901	.....	3,901	7,812
Meade.....	54	340	1	341	320	.....	320	661
Miami.....	101	3,224	180	3,404	3,321	169	3,490	6,894
Mitchell.....	114	2,918	1	2,919	2,763	1	2,764	5,683
Montgomery.....	108	4,106	171	4,277	3,998	217	4,205	8,482
Morris.....	82	2,044	61	2,105	1,903	37	1,940	4,045
Morton.....	25	93	2	95	87	6	93	188
Nemaha.....	124	3,664	22	3,686	3,581	24	3,605	7,291
Neosho.....	101	3,305	46	3,351	3,227	48	3,275	6,626
Ness.....	74	817	.....	817	801	.....	801	1,618
Norton.....	117	1,999	2	2,001	1,817	4	1,821	3,822
Osage.....	119	4,378	141	4,519	4,201	116	4,317	8,836
Osborne.....	127	2,287	22	2,309	2,026	22	2,048	4,357
Ottawa.....	98	2,145	11	2,156	2,092	6	2,098	4,254
Pawnee.....	65	967	16	983	869	8	877	1,860
Phillips.....	131	2,695	26	2,721	2,414	23	2,437	5,158
Pottawatomie.....	118	3,086	40	3,126	2,998	41	3,039	6,165
Pratt.....	82	1,365	41	1,406	1,329	32	1,361	2,767
Rawlins.....	99	1,169	.....	1,169	1,148	.....	1,148	2,317
Reno.....	156	4,905	64	4,969	4,543	61	4,604	9,573
Republic.....	124	3,542	.....	3,542	3,306	.....	3,306	6,848
Rice.....	100	2,646	16	2,662	2,367	22	2,389	5,051
Riley.....	86	2,481	74	2,555	2,405	54	2,459	5,014
Rooks.....	112	1,527	15	1,542	1,504	10	1,514	3,056
Rush.....	68	1,106	.....	1,106	1,020	.....	1,020	2,126
Russell.....	70	1,483	10	1,493	1,443	6	1,449	2,942
Saline.....	93	2,972	83	3,055	3,010	74	3,084	6,139
Scott.....	36	237	.....	237	171	.....	171	408
Sedgwick.....	166	6,237	.....	6,237	6,314	.....	6,314	12,551
Seward.....	23	151	.....	151	158	.....	158	309
Shawnee.....	100	7,931	154	8,085	8,110	152	8,262	16,347
Sheridan.....	70	665	.....	665	589	.....	589	1,254
Sherman.....	84	717	.....	717	622	.....	622	1,339
Smith.....	145	2,942	.....	2,942	2,856	.....	2,856	5,798
Stafford.....	92	1,586	41	1,627	1,488	37	1,525	3,152
Stanton.....	28	153	.....	153	136	1	137	290
Stevens.....	35	162	3	165	147	.....	147	312
Sumner.....	198	4,862	30	4,892	4,773	38	4,811	9,703
Thomas.....	91	835	1	836	734	.....	734	1,570
Trego.....	45	503	1	504	431	6	437	941
Wabaunsee.....	90	2,168	160	2,328	1,885	168	2,053	4,381
Wallace.....	41	461	10	471	340	7	347	818
Washington.....	151	4,251	.....	4,251	4,009	3	4,012	8,263
Wichita.....	43	293	.....	293	227	.....	227	520
Wilson.....	103	2,863	10	2,873	2,716	12	2,728	5,601
Woodson.....	70	1,716	.....	1,716	1,653	.....	1,653	3,369
Wyandotte.....	42	7,478	1,067	8,545	7,189	1,270	8,459	17,004
Totals.....	9,174	245,938	7,248	253,185	235,460	7,493	242,877	496,139

CHURCHES.

SUMMARY showing, by denominations, the number of church organizations, aggregate membership, number of church edifices and value of church property in the state, compiled for the year 1895.

<i>Denominations.</i>	No. of church organizations.	Aggregate membership.	No. of church edifices.	Value of church property.
Advent Christian.....	* 30	990	3	\$3,200
African Methodist Episcopal.....	48	4,678	58	173,400
Associate Presbyterian.....	* 4	160	3	3,300
Baptist.....	* 467	27,604	314	789,899
Brethren in Christ.....	* 9	588	5	9,500
Christian.....	388	34,637	229	498,401
Christian Reformed.....	* 2	109	2	3,000
Christian Connection.....	* 49	1,676	8	10,950
Church of God.....	* 26	956	6	7,300
Congregational.....	179	12,597	165	531,900
Cumberland Presbyterian.....	* 68	2,386	25	55,300
Dunkard (conservative).....	75	3,601	44	62,275
Episcopal.....	76	3,935	55	369,152
Free Methodist.....	* 42	830	14	16,256
Friends.....	* 70	8,257	56	84,815
Hebrew.....	4	403	1	12,000
Independent Church in Christ.....	* 16	495	4	4,600
Lutheran (English).....	* 193	15,633	139	408,510
Lutheran (German).....	133	8,548	71	153,650
Lutheran (Swedish).....	* 40	4,954	27	62,500
Latter-Day Saints.....	* 25	1,072	4	3,300
Methodist Episcopal.....	1,086	79,618	707	1,804,500
Methodist Episcopal (South).....	* 83	3,346	40	83,450
New Jerusalem (Swedenborgian).....	* 3	62	* 1	10,000
Presbyterian.....	349	24,985	275	1,900,700
Reformed Church.....	* 27	1,030	16	52,400
Reformed Presbyterian.....	* 9	758	7	15,000
Roman Catholic.....	296	72,051	265	1,309,950
Seventh-Day Adventist.....	68	2,294	18	18,600
Seventh-Day Baptist.....	* 3	229	1	3,500
Spiritualist.....	* 9	627	.....	.....
Unitarian.....	* 4	185	3	21,500
United Brethren.....	* 155	5,745	.....	.....
United Presbyterian.....	49	3,561	46	123,000
Universalist.....	* 6	411	6	25,000
Wesleyan Methodist.....	* 18	464	6	10,150
Welch Calvinistic Methodist.....	* 5	115	4	3,650
Totals.....	4,114	319,590	2,628	\$8,644,608

* From United States census, 1890.

DENOMINATIONAL SCHOOLS.

SUMMARY showing denomination and location, average attendance, salaries paid, and value of buildings and property.

<i>Name.</i>	<i>Denomination.</i>	<i>Location.</i>	<i>Average yearly attend- ance.</i>	<i>Average monthly salary paid teachers.</i>	<i>Value of buildings and other school property.</i>
Baker University.....	Meth. Episcopal...	Baldwin.....	558	\$100	\$100,000
Bethany College.....	Swedish Lutheran,	Lindsborg	440	65	150,000
Bethany College.....	Episcopal.....	Topeka	240	70	352,000
Central College.....	United Brethren..	Enterprise	166	40	80,000
Emporia College.....	Presbyterian.....	Emporia.....	100	80	.....
Friends' Academy.....	Friends	Glen Elder.....	25	60	3,000
Friends' Academy.....	Friends	Leavenworth..	95	75	5,000
Fairmount Institute.....	Congregational....	Wichita.....	85	65	60,000
Garfield University.....	Christian.....	Wichita.....	150	100	500,000
Hesper Academy	Friends	Hesper.....	40	40	4,150
Highland University.....	Presbyterian.....	Highland.....	100	94	60,000
Kansas Wesleyan University...	Meth. Episcopal...	Salina.....	120	54	75,000
Lane University.....	United Brethren...	Lecompton....	200	35	60,000
Lewis Academy.....	Presbyterian.....	Wichita.....	300	66	100,000
McPherson College.....	Dunkard.....	McPherson....	182	70	65,000
Midland College.....	English Lutheran,	Atchison.....	117	100	75,000
Nazareth Academy.....	Catholic.....	Concordia....	80	.....	25,000
North Branch Academy.....	Friends	North Branch,	52	75	100,000
Oswego Female College.....	Presbyterian.....	Oswego.....	55	70	30,000
Ottawa University.....	Baptist.....	Ottawa.....	400	100	175,000
Southern Kansas Academy.....	Congregational....	Eureka.....	84	60	15,000
Soule College.....	Presbyterian.....	Dodge City....	70	50	52,000
Southwest Kansas College.....	Meth. Episcopal...	Winfield.....	155	55	60,000
St. Benedict's College.....	Catholic.....	Atchison.....	140	.....	90,000
St. John's School.....	Episcopal.....	Salina.....	45	90	85,000
St. Mary's College.....	Catholic.....	St. Mary's....	280	60	95,000
Stockton Academy.....	Congregational....	Stockton.....	50	44	14,600
Washburn College.....	Congregational....	Topeka.....	300	100	225,000
Washington Academy.....	Friends	Washington...	127	75	10,000
Totals .....	.....	.....	4,786	\$68	\$2,034,150

WHEAT.

DIAGRAM showing the relative product of wheat (winter and spring) by five-year periods, beginning with 1870 and ending with 1894.

Years	Comparative yields.
1870 1871 1872 1873 1874	21,403,383 bushels.
1875 1876 1877 1878 1879	95,012,627 bushels.
1880 1881 1882 1883 1884	159,569,786 bushels.
1885 1886 1887 1888 1889	86,674,343 bushels.
1890 1891 1892 1893 1894	214,923,996 bushels.

TABLE showing acres, annual product, value and average yield, winter and spring wheat since 1860.

YEARS.	Acres.	Bushels.	Value.	Av. yld. per acre bus.
1860.....		168,527		.....
1861.....		185,379		.....
1862.....	9,360	202,232	\$149,652 00	21.00
1863.....	16,434	262,953	231,399 00	16.00
1864.....	13,439	201,598	405,212 00	15.00
1865.....	12,768	191,519	338,989 00	15.00
1866.....	12,171	260,456	497,488 00	21.40
1867.....	89,285	1,250,000	2,300,000 00	14.00
1868.....	98,525	1,537,000	2,074,950 00	15.60
1869.....	151,351	2,800,000	2,212,000 00	18.50
1870.....	156,200	2,343,000	2,014,980 00	15.00
1871.....	169,433	2,694,000	3,044,220 00	15.90
1872.....	185,775	2,155,000	3,060,100 00	11.60
1873.....	309,286	4,330,000	4,330,000 00	14.00
1874.....	716,205	9,881,383	7,631,671 00	13.79
1875.....	743,206	13,209,403	11,350,375 38	17.77
1876.....	1,023,183	14,620,225	12,413,780 89	14.28
1877.....	1,063,993	14,316,705	12,240,128 72	13.45
1878.....	1,730,812	32,315,358	18,441,066 84	18.67
1879.....	1,932,798	20,550,936	18,448,711 14	10.63
1880.....	2,444,434	25,279,884	20,980,668 57	10.34
1881.....	2,182,872	20,479,689	21,705,275 80	9.38
1882.....	1,602,997	35,734,846	24,003,820 90	22.29
1883.....	1,559,392	30,024,936	22,322,119 58	19.25
1884.....	2,237,128	48,050,431	20,516,560 93	21.47
1885.....	1,290,549	10,772,181	6,829,945 00	8.34
1886.....	1,758,393	14,579,093	8,482,503 00	8.29
1887.....	1,373,915	9,278,501	5,759,449 60	6.75
1888.....	1,120,119	16,724,717	12,097,814 11	14.93
1889.....	1,594,285	35,319,851	19,917,701 21	22.15
1890.....	2,321,113	28,801,214	23,410,548 00	12.40
1891.....	3,733,910	58,550,653	42,596,759 09	15.68
1892.....	4,129,829	74,538,906	40,691,762 03	18.05
1893.....	5,110,873	24,827,523	11,032,932 04	4.85
1894.....	4,840,892	28,205,700	11,297,797 13	5.82

CORN.

DIAGRAM showing relative product of corn, by five-year periods, beginning with 1870 and ending with 1894.

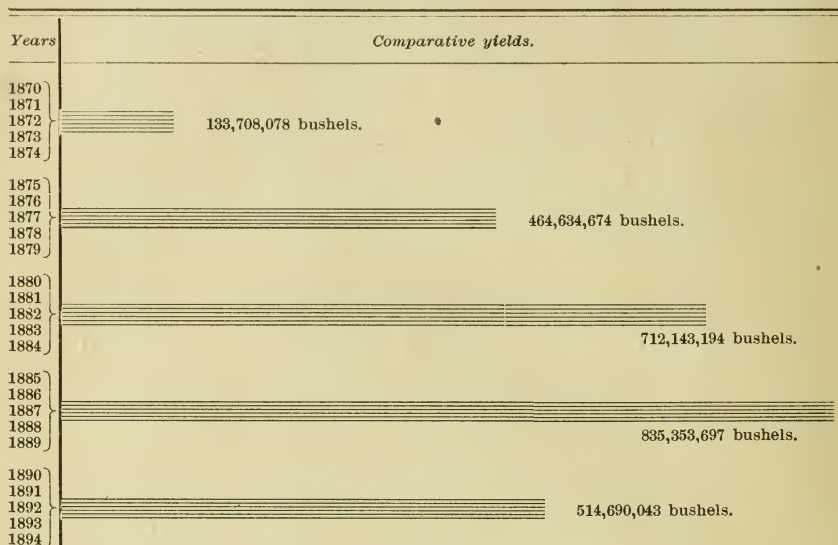


TABLE showing acres, annual product, value and average yield per acre of corn since 1860.

YEARS.	Acres.	Bushels.	Value.	Av. yld. per acre bus.
1860		5,678,834		
1861		6,246,717		
1862	170,365	6,814,601	\$2,180,672 00	40.00
1863	193,597	8,518,251	2,555,475 00	44.00
1864	186,923	4,673,081	6,402,121 00	25.00
1865	163,463	6,729,236	3,566,495 00	41.00
1866	190,858	6,527,358	4,112,235 00	34.20
1867	211,373	8,159,000	4,487,450 00	38.60
1868	360,388	6,487,000	6,422,130 00	18.00
1869	506,198	24,500,000	10,780,000 00	48.40
1870	505,892	16,685,000	9,677,300 00	28.00
1871	617,325	24,693,000	7,160,970 00	40.00
1872	769,636	29,631,000	6,518,820 00	38.50
1873	1,202,046	47,000,000	14,570,000 00	39.10
1874	1,525,421	15,699,078	12,064,424 00	10.25
1875	1,932,861	80,798,769	19,071,698 15	48.80
1876	1,844,454	82,308,176	19,217,332 24	43.68
1877	2,563,112	103,497,831	20,206,184 92	40.38
1878	2,405,482	89,324,971	17,018,968 79	37.13
1879	2,995,070	108,704,927	26,562,674 46	36.29
1880	3,554,396	101,421,718	24,926,079 07	28.53
1881	4,171,554	80,760,542	44,869,963 29	19.33
1882	4,441,836	157,005,722	51,888,366 27	35.36
1883	4,653,170	182,084,526	47,492,663 43	39.14
1884	4,545,908	190,870,686	39,512,734 32	41.99
1885	5,266,034	177,350,703	40,428,327 08	33.67
1886	5,802,018	139,569,132	37,966,031 80	24.05
1887	6,530,392	75,791,454	26,836,422 70	11.60
1888	6,993,207	168,754,087	52,395,948 65	24.13
1889	6,820,693	273,888,321	51,649,876 18	40.15
1890	5,755,691	51,090,229	21,491,961 00	8.84
1891	5,209,234	139,363,991	48,057,978 93	26.75
1892	5,603,588	138,658,621	42,089,849 01	27.74
1893	6,172,462	118,624,369	32,621,762 62	19.20
1894	6,404,705	66,952,833	25,354,190 27	10.45

OATS.

DIAGRAM showing relative product of oats, by five-year periods, beginning with 1870 and ending with 1894.

Years	Comparative yields.
1870 } 1871 } 1872 } 1873 } 1874 }	30,888,586 bushels.
1875 } 1876 } 1877 } 1878 } 1879 }	65,686,865 bushels.
1880 } 1881 } 1882 } 1883 } 1884 }	103,406,006 bushels.
1885 } 1886 } 1887 } 1888 } 1889 }	216,769,837 bushels.
1890 } 1891 } 1892 } 1893 } 1894 }	159,382,695 bushels.

TABLE showing acres, annual product, value and average yield per acre of oats since 1860.

YEARS.	Acres.	Bushels.	Value.	Av. yld. per acre bus.
1860.....		80,744		
1861.....		88,818		
1862.....	2,936	96,892	\$30,037 00	33.00
1863.....	3,876	116,270	44,183 00	30.00
1864.....	5,051	146,500	141,372 00	29.00
1865.....	4,567	155,290	102,880 00	34.00
1866.....	5,136	200,316	94,148 00	39.00
1867.....	6,555	236,000	115,640 00	36.00
1868.....	9,880	247,000	140,790 00	25.00
1869.....	35,629	1,500,000	555,000 00	42.10
1870.....	117,079	3,688,000	1,475,200 00	31.50
1871.....	127,547	4,056,000	1,216,800 00	31.80
1872.....	187,200	6,084,000	1,338,480 00	32.50
1873.....	283,636	9,360,000	2,152,800 00	33.00
1874.....	314,926	13,326,637	4,064,424 00	24.25
1875.....	289,437	9,794,051	2,396,257 78	33.88
1876.....	391,845	12,386,216	2,707,736 51	31.61
1877.....	310,226	12,768,488	2,050,001 77	41.16
1878.....	444,191	17,411,473	2,937,900 63	39.19
1879.....	573,892	13,326,637	3,397,416 33	23.22
1880.....	477,827	11,483,796	2,918,689 17	24.03
1881.....	338,130	9,900,768	3,855,749 77	29.28
1882.....	529,234	21,946,284	5,766,579 15	41.46
1883.....	694,576	30,987,864	6,135,778 95	44.61
1884.....	780,831	29,087,294	5,568,332 75	37.25
1885.....	905,372	31,561,490	6,558,303 45	34.86
1886.....	1,181,807	35,892,985	8,860,603 55	30.37
1887.....	1,577,076	46,727,418	12,232,243 62	29.62
1888.....	1,656,814	54,665,055	12,470,908 35	32.99
1889.....	1,689,801	47,922,889	7,654,812 83	28.42
1890.....	1,227,371	29,175,582	9,174,400 00	23.77
1891.....	1,298,745	39,904,443	10,594,457 48	30.72
1892.....	1,559,049	43,722,484	11,140,224 70	28.04
1893.....	1,758,127	28,194,717	6,488,342 03	16.03
1894.....	1,427,444	18,385,469	5,071,543 74	12.88

LIVE STOCK.

TABLE showing the number of the various kinds of live stock and their aggregate value for the years given.

YEARS.	Horses.	Mules and asses.	Milch cows.	Other cattle.	Sheep.	Swine.	Value.
1860.....	20,344	1,496	28,550	61,133	17,569	138,224	\$3,332,450
1870.....	117,786	11,786	123,440	250,527	109,088	206,587	23,173,185
1875.....	207,376	24,964	225,028	478,295	106,224	292,858	28,610,267
1880.....	367,589	58,303	366,640	748,672	426,492	1,281,630	61,563,956
1881.....	383,805	58,780	406,706	839,751	806,323	1,173,199	69,814,340
1882.....	398,678	56,654	433,381	971,116	978,077	1,228,683	83,866,199
1883.....	423,426	59,262	471,548	1,133,154	1,154,196	1,393,968	104,539,888
1884.....	461,136	61,889	530,904	1,328,021	1,206,297	1,953,144	115,645,050
1885.....	513,830	75,177	575,928	1,402,920	875,193	2,461,522	118,071,808
1886.....	572,059	83,642	627,481	1,462,736	652,144	1,966,149	129,559,527
1887.....	648,037	89,957	692,858	1,568,628	538,767	1,847,394	126,558,042
1888.....	700,723	92,445	742,639	1,619,849	402,744	1,433,245	131,830,778
1889.....	719,394	90,357	723,552	1,738,436	293,853	1,641,955	116,191,465
1890.....	716,459	78,346	674,705	1,696,081	281,654	2,192,231	113,533,342
1891.....	776,533	77,170	696,611	1,770,591	260,658	2,085,875	117,674,951
1892.....	804,923	79,262	631,386	1,708,368	240,568	1,605,098	109,024,141
1893.....	860,186	88,585	567,353	1,505,273	224,952	1,406,086	98,266,668
1894.....	864,651	86,729	524,127	1,291,793	166,384	1,623,375	78,738,754

PRODUCTS OF LIVE STOCK.

TOTAL VALUE of the products of live stock, to wit: Animals slaughtered and sold for slaughter, wool clip, butter and cheese manufactured, and poultry, eggs and milk sold, for the years given.

YEARS.	Value.
1880.....	\$16,933,255 00
1881.....	21,682,888 25
1882.....	27,559,933 70
1883.....	32,545,737 00
1884.....	40,143,992 00
1885.....	37,130,647 06
1886.....	35,350,525 62
1887.....	37,545,263 74
1888.....	37,284,447 67
1889.....	40,762,488 62
1890.....	39,998,285 04
1891.....	45,724,709 24
1892.....	42,853,835 68
1893.....	51,225,617 55
1894.....	50,708,714 08

POPULATION, AREA, ETC.

TABLE showing, by counties, the date of organization, area, and population for the years 1893 and 1894.

COUNTIES.	Date of organization.	Population.		Area, 1894.	
		1893.	1894.	Square miles.	Acres.
Allen	1855	12,372	12,770	504	322,560
Anderson	1855	12,172	13,275	576	368,640
Atchison	1855	*26,455	26,455	423	270,720
Barber	1873	9,378	5,753	1,134	725,760
Barton	1872	13,776	13,448	900	576,000
Bourbon	1855	25,372	25,090	637	407,680
Brown	1855	19,828	19,416	576	368,640
Butler	1855	22,565	21,126	1,428	913,920
Chase	1859	7,322	6,789	750	480,000
Chautauqua	1875	10,614	10,568	651	416,640
Cherokee	1866	28,309	26,507	589	376,960
Cheyenne	1866	4,868	5,044	1,020	652,800
Clark	1885	2,004	1,724	975	624,000
Clay	1866	15,337	15,111	660	422,400
Cloud	1866	18,037	17,044	720	460,800
Coffey	1859	14,801	15,400	648	414,720
Comanche	1885	2,177	1,720	795	508,800
Cowley	1870	35,349	30,490	1,112	711,680
Crawford	1867	31,889	33,109	592	378,880
Decatur	1880	7,686	7,759	900	576,000
Dickinson	1857	20,900	21,579	851	544,640
Doniphan	1855	11,503	11,437	379	242,560
Douglas	1855	23,104	23,113	469	300,150
Edwards	1874	3,640	3,320	612	391,680
Elk	1875	10,980	10,183	651	416,640
Ellis	1867	7,663	7,517	900	576,000
Ellsworth	1867	9,597	8,752	720	460,800
Finney	1884	3,388	3,553	1,296	829,440
Ford	1873	5,692	5,096	1,080	691,200
Franklin	1857	19,684	19,980	576	368,640
Geary	1855	9,632	10,091	407	260,480
Gove	1886	2,409	2,368	1,080	691,200
Graham	1880	4,383	4,066	900	576,000
Grant	1888	1,330	771	576	368,640
Gray	1887	2,050	1,503	864	552,960
Greeley	1888	1,345	1,321	780	499,200
Greenwood	1862	14,704	15,090	1,155	739,200
Hamilton	1886	1,807	1,735	972	622,080
Harper	1873	14,486	10,452	810	518,400
Harvey	1872	16,613	16,600	540	345,600
Haskell	1887	1,015	831	576	368,640
Hodgeman	1879	2,462	2,172	864	552,960
Jackson	1857	15,531	16,226	658	421,120
Jefferson	1855	15,238	16,174	568	363,520
Jewell	1870	17,930	17,468	900	576,000
Johnson	1855	11,961	16,147	480	307,200
Kearny	1888	1,242	1,214	864	552,960
Kingman	1873	11,055	10,091	864	552,960
Kiowa	1886	3,187	2,750	720	460,800
Labette	1867	26,201	25,956	649	415,360
Lane	1886	2,073	1,793	720	460,800
Leavenworth	1855	32,854	33,216	455	291,200
Lincoln	1870	9,662	9,294	720	460,800
Linn	1855	15,466	15,215	637	407,680
Logan	1888	2,933	2,603	1,080	691,200
Lyon	1858	22,619	23,625	858	549,120
Marion	1865	20,241	20,193	954	610,560
Marshall	1855	23,319	25,141	900	576,000
McPherson	1870	21,533	21,359	900	576,000
Meade	1885	2,048	2,025	975	624,000

POPULATION, AREA, ETC.—CONCLUDED.

COUNTIES.	Date of organization.	Population.		Area, 1894.	
		1893.	1894.	Square miles.	Acres.
Miami.....	1855	18,666	18,924	588	376,320
Mitchell.....	1870	13,913	13,936	720	460,800
Montgomery.....	1869	22,379	24,452	648	414,720
Morris.....	1858	10,917	10,877	700	448,000
Morton.....	1886	574	457	729	466,560
Nemaha.....	1855	18,877	18,922	720	460,800
Neosho.....	1864	16,990	17,699	576	368,640
Ness.....	1880	4,790	4,501	1,080	691,200
Norton.....	1872	9,891	9,711	900	576,000
Osage.....	1859	23,324	23,788	720	460,800
Osborne.....	1871	10,987	11,196	900	576,000
Ottawa.....	1866	11,705	11,250	720	460,800
Pawnee.....	1872	5,331	5,144	756	483,840
Phillips.....	1872	12,593	13,067	900	576,000
Pottawatomie.....	1856	16,850	16,176	848	542,720
Pratt.....	1879	8,591	7,509	720	460,800
Rawlins.....	1881	6,101	6,217	1,080	691,200
Reno.....	1872	27,139	26,066	1,260	806,400
Republic.....	1868	17,047	16,771	720	460,800
Rice.....	1871	14,465	13,874	720	460,800
Riley.....	1855	12,369	11,967	617	394,880
Rooks.....	1872	7,144	7,179	900	576,000
Rush.....	1874	5,487	5,150	720	460,800
Russell.....	1872	7,447	7,250	900	576,000
Saline.....	1859	18,158	16,144	720	460,800
Scott.....	1886	1,142	1,163	720	460,800
Sedgwick.....	1870	40,177	39,043	1,008	645,120
Seward.....	1886	1,000	826	648	414,720
Shawnee.....	1855	47,219	45,125	558	357,120
Sheridan.....	1880	3,370	3,241	900	576,000
Sherman.....	1886	6,266	5,875	1,080	691,200
Smith.....	1872	14,529	14,476	900	576,000
Stafford.....	1879	9,163	8,688	792	506,880
Stanton.....	1887	985	772	672	430,080
Stevens.....	1886	1,144	797	729	466,560
Sumner.....	1871	31,684	27,126	1,188	760,320
Thomas.....	1885	5,032	4,415	1,080	691,200
Trego.....	1879	2,610	2,481	900	576,000
Wabaunsee.....	1859	11,093	11,170	804	514,560
Wallace.....	1888	2,530	2,483	900	576,000
Washington.....	1860	21,978	20,408	900	576,000
Wichita.....	1886	2,040	1,677	720	460,800
Wilson.....	1865	13,740	14,023	576	368,640
Woodson.....	1855	8,545	8,975	504	322,560
Wyandotte.....	1859	56,840	56,722	153	97,920
Totals.....		1,366,613	1,338,331	82,144	52,572,160

*1892; no returns for 1893 and 1894.

POPULATION OF CITIES OF KANSAS

Having 1,000 inhabitants and upwards, March 1, 1894, arranged according to rank.

Rank..	Name.	Popula- tion.	Rank..	Name.	Popula- tion.
1	Kansas City.....	42,646	53	Sterling.....	1,865
2	Topeka.....	30,724	54	Dodge City.....	1,811
3	Wichita.....	21,619	55	Seneca.....	1,806
4	Leavenworth.....	20,466	56	Goodland.....	1,761
5	Atchison.....	13,978	57	Neodesha.....	1,718
6	Fort Scott.....	10,740	58	Belleville.....	1,714
7	Lawrence.....	10,306	59	Larned.....	1,692
8	Hutchinson.....	8,797	60	Anthony.....	1,686
9	Pittsburg.....	8,545	61	Wamego.....	1,672
10	Parsons.....	8,220	62	Minneapolis.....	1,647
11	Emporia.....	8,103	63	Lyons.....	1,634
12	Arkansas City.....	7,120	64	Washington.....	1,629
13	Ottawa.....	6,669	65	Scranton.....	1,569
14	Winfield.....	6,115	66	Pratt.....	1,569
15	Salina.....	5,541	67	Iola.....	1,565
16	Newton.....	5,529	68	Florence.....	1,539
17	Junction City.....	5,066	69	Herington.....	1,538
18	Wellington.....	4,652	70	Humboldt.....	1,410
19	Coffeyville.....	3,925	71	Lindsborg.....	1,404
20	Abilene.....	3,635	72	Ellsworth.....	1,403
21	Independence.....	3,589	73	Garden City.....	1,392
22	Osage City.....	3,566	74	Peabody.....	1,391
23	Argentine.....	3,559	75	Caldwell.....	1,388
24	Chanute.....	3,483	76	Fredonia.....	1,387
25	Horton.....	3,447	77	Baxter Springs.....	1,366
26	El Dorado.....	3,447	78	Burlingame.....	1,363
27	Olathe.....	3,427	79	Sabetha.....	1,354
28	Holton.....	3,282	80	Harper.....	1,306
29	Girard.....	3,114	81	Pleasanton.....	1,302
30	Manhattan.....	3,067	82	Nickerson.....	1,261
31	Concordia.....	3,043	83	Hays City.....	1,184
32	Paola.....	3,031	84	Clyde.....	1,166
33	McPherson.....	3,025	85	Valley Falls.....	1,157
34	Clay Centre.....	2,932	86	Cherokee.....	1,140
35	Galena.....	2,782	87	Blue Rapids.....	1,126
36	Weir City.....	2,738	88	Sedan.....	1,119
37	Osawatomie.....	2,678	89	Frankfort.....	1,117
38	Great Bend.....	2,506	90	Frontenac.....	1,117
39	Hiawatha.....	2,497	91	Erie.....	1,091
40	Garnett.....	2,353	92	Baldwin.....	1,085
41	Council Grove.....	2,342	93	Phillipsburg.....	1,078
42	Oswego.....	2,265	94	Enterprise.....	1,057
43	Marysville.....	2,256	95	Howard.....	1,044
44	Burlington.....	2,244	96	Osborne.....	1,028
45	Cherry Vale.....	2,243	97	Augusta.....	1,026
46	Beloit.....	2,186	98	Alma.....	1,025
47	Marion.....	2,162	99	Russell.....	1,022
48	Columbus.....	2,154	100	Ellis.....	1,018
49	Eureka.....	2,140	101	Caney.....	1,008
50	Chetopa.....	1,997	102	Norton.....	1,005
	Rosedale.....	1,969	103	Osage Mission.....	1,000
	Kingman.....	1,962			

AGRICULTURAL STATISTICS, ETC.

CROP STATISTICS, 1893 AND 1894.

WINTER WHEAT.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	7,741	72,369	\$33,289 74	3,565	51,904	\$21,799 68
Anderson.....	6,915	78,000	35,100 00	3,906	42,644	17,910 48
Atchison.....	23,478	187,820	108,935 60	18,710	341,817	153,817 65
Barber.....	80,407	160,812	64,324 80	74,829	251,424	93,026 88
Barton.....	191,906	182,310	72,924 00	186,807	418,444	167,377 60
Bourbon.....	15,904	240,618	110,684 28	9,871	145,979	58,391 60
Brown.....	46,364	58,415	29,207 50	33,697	858,598	360,611 16
Butler.....	39,056	380,783	152,313 20	24,009	211,270	88,733 40
Chase.....	9,281	176,339	74,062 38	7,590	85,839	36,910 77
Chautauqua.....	24,720	300,592	135,266 40	17,453	308,389	117,187 82
Cherokee.....	47,117	508,860	228,987 00	41,398	786,560	346,086 40
Cheyenne.....	11,849	28,432	11,372 80	13,267	.....	.....
Clark.....	18,739	28,104	11,241 60	21,170	44,455	13,781 05
Clay.....	44,870	157,045	70,670 25	42,371	432,180	181,515 60
Cloud.....	52,679	199,122	89,604 90	41,586	176,320	70,528 00
Coffey.....	10,068	149,808	71,907 84	6,528	88,768	39,945 60
Comanche.....	23,246	72,980	30,651 60	21,882	65,645	22,975 75
Cowley.....	87,366	1,188,176	475,270 40	79,879	757,248	257,464 32
Crawford.....	34,443	322,036	161,018 00	25,111	446,960	169,844 80
Decatur.....	25,292	.....	.....	22,839	.....	.....
Dickinson.....	103,744	622,464	267,659 52	95,815	1,133,483	430,723 54
Doniphan.....	43,681	148,510	78,710 30	32,614	704,448	302,912 64
Douglas.....	32,977	381,537	183,137 76	23,571	407,304	179,213 76
Edwards.....	40,739	43,996	18,918 28	45,415	4,540	1,725 20
Elk.....	19,561	323,928	136,049 76	7,796	127,376	52,224 16
Ellis.....	90,327	.....	.....	112,925	276,665	102,366 05
Ellsworth.....	103,776	392,268	164,752 56	92,421	426,979	166,521 81
Finney.....	16,937	1,014	446 16	26,607	26,670	9,601 20
Ford.....	38,242	24,472	10,522 96	47,209	41,540	18,277 60
Franklin.....	14,919	212,595	102,045 60	10,832	171,241	71,921 22
Geary.....	21,197	156,850	72,151 00	15,586	200,746	84,313 32
Gove.....	27,311	3,822	1,719 90	28,308	4,528	1,901 76
Graham.....	19,981	.....	.....	23,444	14,064	5,906 88
Grant.....	7,564	.....	.....	3,847	3,845	1,730 25
Gray.....	22,799	6,837	2,939 91	22,438	5,832	2,099 52
Greeley.....	15,860	.....	.....	14,132	8,478	3,815 10
Greenwood.....	6,445	67,860	29,179 80	4,789	53,634	23,062 62
Hamilton.....	12,319	.....	.....	9,012	13,020	8,109 00
Harper.....	151,557	1,159,407	521,733 15	143,114	991,771	376,872 98
Harvey.....	70,587	656,450	295,402 50	71,804	376,971	147,018 69
Haskell.....	16,745	9,042	4,159 32	16,645	996	448 20
Hodgeman.....	27,253	.....	.....	29,785	5,956	2,263 28
Jackson.....	10,198	16,819	8,409 50	4,241	52,155	22,948 70
Jefferson.....	26,796	195,610	93,892 80	16,157	235,566	91,870 24
Jewell.....	54,326	89,092	39,200 48	34,627	96,950	39,749 50
Johnson.....	28,308	338,559	162,508 32	19,693	380,457	155,987 37
Kearny.....	11,390	1,816	908 00	8,468	11,851	5,332 95
Kingman.....	92,724	380,165	152,066 00	87,737	279,873	106,351 74
Kiowa.....	55,524	333,144	133,257 60	52,196	31,317	11,587 29
Labette.....	57,537	621,396	260,986 32	51,004	1,077,186	430,874 40
Lane.....	37,505	.....	.....	41,956	94,401	33,040 35
Leavenworth.....	38,772	472,808	274,228 64	27,270	446,670	192,068 10
Lincoln.....	92,298	99,680	42,862 40	93,620	486,824	189,861 36
Linn.....	13,621	198,180	99,090 00	12,200	150,060	61,524 60
Logan.....	58,622	.....	.....	58,397	5,838	2,451 96
Lyon.....	8,849	80,522	38,650 56	5,385	69,564	31,999 44
Marion.....	80,373	600,381	270,171 45	106,739	1,114,344	456,881 04

WINTER WHEAT—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Marshall.....	23,030	73,468	\$35,264 64	31,091	497,440	\$198,976 00
McPherson.....	150,170	1,231,390	554,125 50	145,381	1,046,736	418,694 40
Meade.....	15,299	16,518	6,607 20	20,492	64,547	23,882 39
Miami.....	14,373	189,140	109,701 20	11,936	177,600	78,144 00
Mitchell.....	96,011	351,396	154,614 24	92,781	500,087	205,035 67
Montgomery.....	51,216	632,515	265,656 30	45,948	1,025,087	399,783 93
Morris.....	16,231	116,856	51,416 64	5,894	56,693	24,944 92
Morton.....	6,428	.....	.....	2,385	833	391 51
Nemaha.....	19,966	38,328	17,247 60	13,155	248,619	111,878 55
Neosho.....	36,432	368,687	165,909 15	25,499	377,128	169,707 60
Ness.....	73,832	.....	.....	75,184	108,264	41,140 32
Norton.....	26,744	3,204	1,441 80	31,622	7,905	3,794 40
Osage.....	12,292	115,044	52,920 24	6,471	98,352	44,258 40
Osborne.....	71,862	130,788	58,854 60	74,990	148,476	60,875 16
Ottawa.....	75,089	176,455	79,404 75	71,974	492,300	191,997 00
Pawnee.....	86,693	76,288	30,515 20	104,332	109,548	41,628 24
Phillips.....	34,874	24,410	11,716 80	31,115	102,368	47,089 28
Pottawatomie.....	17,313	164,808	77,459 76	11,597	129,872	55,844 96
Pratt.....	123,847	852,064	340,825 60	117,646	164,704	59,293 44
Rawlins.....	20,224	6,066	2,669 04	24,395	8,535	3,926 10
Reno.....	118,698	807,144	339,000 48	103,380	325,647	120,489 39
Republic.....	22,205	26,646	11,724 24	13,196	45,392	20,426 40
Rice.....	132,470	1,326,017	556,927 14	134,106	305,760	116,188 80
Riley.....	15,792	104,225	45,859 00	9,118	99,568	43,809 92
Rooks.....	78,726	47,232	21,726 72	81,969	221,316	99,592 20
Rush.....	99,154	15,864	7,138 80	105,664	50,718	20,287 20
Russell.....	102,317	5,115	2,301 75	108,600	179,190	77,051 70
Saline.....	109,448	700,464	315,208 80	108,831	1,123,128	538,019 92
Scott.....	15,002	.....	.....	21,889	44,652	17,860 80
Sedgwick.....	132,394	868,504	390,826 80	120,824	833,680	316,798 40
Seward.....	6,865	1,372	548 80	6,300	10,710	4,284 00
Shawnee.....	12,343	96,265	46,207 20	6,523	96,016	40,326 72
Sheridan.....	31,715	.....	.....	32,351	2,910	1,309 50
Sherman.....	25,351	30,420	12,168 00	16,406	.....	.....
Smith.....	59,518	119,035	53,565 75	58,562	192,668	92,480 64
Stafford.....	86,811	364,602	145,840 80	102,583	307,746	116,943 48
Stanton.....	10,997	.....	.....	5,359	1,605	690 15
Stevens.....	7,310	.....	.....	2,620	.....	.....
Sumner.....	274,483	2,717,374	1,222,813 30	272,910	3,012,924	1,144,911 12
Thomas.....	72,313	8,676	3,904 20	79,047	2,371	1,114 37
Trego.....	27,123	.....	.....	27,358	82,074	30,367 38
Wabaunsee.....	17,502	161,712	72,770 40	12,575	144,864	66,637 44
Wallace.....	24,648	492	231 24	21,083	632	290 72
Washington.....	32,741	157,152	75,432 96	24,803	295,148	132,816 60
Wichita.....	25,319	3,795	1,897 50	41,414	45,554	18,221 60
Wilson.....	16,769	208,770	93,946 50	11,344	195,100	76,089 00
Woodson.....	3,174	44,778	20,597 88	1,469	27,456	11,806 08
Wyandotte.....	9,053	119,490	64,524 60	7,265	111,146	52,238 62
Totals.....	4,909,972	24,634,414	\$10,954,110 96	4,675,704	28,175,656	\$11,285,804 80

SPRING WHEAT.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen	45					
Anderson	188	1,316	\$526 40	41	287	\$114 80
Atchison	260	2,340	1,170 00	7		
Barber	77					
Barton	398	477	190 80	209		
Bourbon	30			42		
Brown	1,595	7,656	3,215 52	109	2,295	872 10
Butler	42			10		
Chase	131			9		
Chautauqua	65			15		
Cherokee	7					
Cheyenne	37,437	78,612	31,444 80	31,013		
Clark	33					
Clay	20	105	47 25	32		
Cloud	95			85		
Coffey	22			16		
Comanche	30			26		
Cowley	43			79	1,062	329 22
Crawford	17	170	81 60			
Decatur	17,936			11,376	3,410	1,295 80
Dickinson	1,157			17		
Doniphan	2,020	19,300	8,685 00	17	204	81 60
Douglas	88					
Edwards	15			1		
Elk	37			20		
Ellis	71			13		
Ellsworth	236			35		
Finney	939			821	786	290 80
Ford	360	125	52 50	94	36	14 40
Franklin	95					
Geary	40					
Gove	406	112	44 80	138		
Graham	3,638			2,733		
Grant	189			5		
Gray	417			69	40	16 00
Greeley	1,399			1,115	1,503	601 20
Greenwood	5					
Hamilton	957			572	225	90 00
Harper	3			20		
Harvey	10			16		
Haskell	237			36		
Hodgeman	76			25		
Jackson	15	150	67 50			
Jefferson				37		
Jewell	146			234		
Johnson				20	240	100 80
Kearny	995	392	176 40	404	606	248 46
Kingman	8					
Kiowa						
Labette	90					
Lane	212			51		
Leavenworth	104					
Lincoln	76					
Linn	125	1,180	472 00	40		
Logan	2,728	1,632	652 80	2,361	918	394 74
Lyon	192			51		
Marion	23	160	72 00	48	288	106 56
Marshall	161	1,937	832 91	171	2,565	974 70
McPherson	5					
Meade	250			17		
Miami	206			21		
Mitchell	1,064			9		
Montgomery	9			52		
Morris	8			32		
Morton	5			5		
Nemaha	46	352	140 80	74	990	386 10
Neosho	51			16		
Ness	375			62	6	2 10
Norton	6,653			9,199	549	247 05
Osage	10					
Osborne	80			45		
Ottawa	26			43		
Pawnee	696			31		
Phillips	1,822	2,912	1,164 80	854		
Pottawatomie				3		

SPRING WHEAT—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....						
Rawlins.....	35,416	10,623	\$4,249 20	26,133	3,918	\$1,606 38
Reno.....	10			105		
Republic.....	215	192	86 40	58		
Rice.....						
Riley.....	34			2		
Rooks.....	485			88		
Rush.....	1,118			121		
Russell.....	93					
Saline.....	45			44		
Scott.....	643			354	530	196 10
Sedgwick.....	54			50	49	18 13
Seward.....	70					
Shawnee.....	8					
Sheridan.....	5,677			3,648		
Sherman.....	46,613	53,600	21,440 00	51,670	327	147 15
Smith.....	480	672	268 80	210	300	123 00
Stafford.....	3			76		
Stanton.....	83			27		
Stevens.....	10					
Sumner.....	3	30	12 00	50		
Thomas.....	17,652			14,263	8,556	3,593 52
Trego.....	194			43		
Wabunsee.....	961	6,912	2,764 80	7	60	24 00
Wallace.....	3,243	128	51 20	5,077		
Washington.....	368	2,024	910 80	140		
Wichita.....	320			196	294	117 60
Wilson.....	49			17		
Woodson.....	5			17		
Wyandotte.....				91		
Totals.....	200,901	193,109	\$78,821 08	165,188	30,044	\$11,992 33

CORN.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	73,795	1,328,310	\$358,643 70	72,278	1,301,004	\$455,351 40
Anderson.....	72,778	2,183,340	545,835 00	78,384	1,489,296	536,146 56
Atchison.....	68,804	2,339,336	584,834 00	66,094	1,454,068	552,545 84
Barber.....	28,449	113,796	45,513 40	39,150	313,200	128,412 00
Barton.....	56,916	284,580	85,374 00	49,338	493,380	197,352 00
Bourbon.....	71,186	1,779,650	533,895 00	72,201	1,444,020	505,407 00
Brown.....	132,964	5,983,380	1,675,346 40	129,841	2,337,138	794,626 92
Butler.....	132,943	1,994,145	63,812 40	143,888	1,434,880	503,608 00
Chase.....	50,918	1,272,950	381,885 00	45,622	456,220	173,363 60
Chautauqua.....	45,964	689,460	234,416 40	50,583	758,745	288,323 10
Cherokee.....	55,752	1,115,040	356,812 80	57,871	1,446,775	593,177 75
Cheyenne.....	32,529	260,232	72,864 96	43,351		
Clark.....	4,148	8,296	3,733 20	2,597	12,985	6,492 50
Clay.....	111,821	2,124,599	531,149 75	110,579	165,868	79,616 64
Cloud.....	116,821	1,635,494	441,583 38	120,272	601,360	228,516 80
Coffey.....	86,623	1,905,706	571,711 80	94,930	1,234,090	493,636 00
Comanche.....	5,897	11,794	5,307 30	3,579	28,632	10,593 84
Cowley.....	111,979	1,343,748	537,499 20	106,147	849,176	322,686 88
Crawford.....	66,629	1,399,209	419,762 70	60,031	1,560,806	546,282 10
Decatur.....	73,727	737,270	184,317 50	75,627	226,881	113,440 50
Dickinson.....	96,035	1,344,490	363,012 30	93,833	140,750	56,300 00
Doniphan.....	72,784	3,275,280	982,584 00	61,726	1,543,150	586,397 00
Douglas.....	66,257	2,318,995	695,698 50	68,379	1,435,959	574,383 60
Edwards.....	12,663	63,315	24,059 70	14,841	74,205	29,682 00
Elk.....	56,499	1,016,982	325,434 24	63,923	1,022,768	398,879 52
Ellis.....	21,813	174,504	48,861 12	12,420	24,840	8,694 00
Ellsworth.....	48,568	485,680	131,133 60	29,818	149,000	65,599 60
Finney.....	1,281	5,124	2,049 60	1,571	6,284	2,325 08
Ford.....	9,451	37,804	16,633 76	8,097	12,145	6,072 50
Franklin.....	86,812	2,170,300	694,496 00	87,784	1,316,760	474,033 60
Geary.....	37,500	900,000	234,000 00	39,248	235,488	94,195 20

CORN — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Gove.....	10,776	21,552	\$6,896 64	5,214		
Graham.....	30,643	214,501	68,640 32	31,678	126,712	\$50,684 80
Grant.....	1,989		495		1,980	990 00
Gray.....	2,948			1,612		
Greeley.....	7,294			3,899	11,697	5,848 50
Greenwood.....	90,885	2,090,355	627,106 50	111,084	1,110,840	444,336 00
Hamilton.....	1,812			1,265		
Harper.....	43,441	217,205	76,021 75	50,108		
Harvey.....	64,541	968,115	290,434 50	63,675	764,100	267,435 00
Haskell.....	1,987	5,961	2,682 45	1,792	17,920	9,856 00
Hodgeman.....	2,421			3,385		
Jackson.....	99,354	3,576,744	929,953 44	110,873	1,995,714	718,457 04
Jefferson.....	89,430	2,861,760	715,440 00	99,241	1,984,820	734,383 40
Jewell.....	173,166	2,943,822	735,955 50	194,115	582,345	221,291 10
Johnson.....	67,676	1,962,604	549,529 12	69,804	1,745,100	610,785 00
Kearny.....	565			620	5,580	2,790 00
Kingman.....	49,552	198,208	69,372 80	62,975	566,775	209,706 75
Kiowa.....	9,985	49,925	18,971 50	9,164	45,820	18,328 00
Labette.....	43,207	820,933	229,861 24	48,303	1,449,090	478,199 70
Lane.....	2,856			2,408		
Leavenworth.....	49,688	1,341,576	402,472 80	54,165	1,029,135	411,654 00
Lincoln.....	47,461	616,993	197,437 76	39,943	159,772	70,299 68
Linn.....	78,772	1,654,212	479,721 48	80,763	1,696,023	610,568 28
Logan.....	10,450	31,350	14,107 50	8,480	42,400	21,200 00
Lyon.....	93,925	3,099,525	867,867 00	118,393	1,065,537	500,802 39
Marion.....	91,080	1,548,360	433,540 80	98,872	988,720	444,924 00
Marshall.....	177,627	4,263,048	1,065,762 00	185,678	2,042,458	694,435 72
McPherson.....	89,649	1,344,735	403,420 50	89,095	712,760	249,466 00
Meade.....	4,556			1,655		
Miami.....	98,904	2,472,600	791,232 00	103,243	2,477,832	941,576 16
Mitchell.....	65,352	784,224	203,898 24	73,739	442,434	176,973 60
Montgomery.....	53,939	916,963	275,088 90	59,417	950,672	351,748 64
Morris.....	67,479	1,282,101	384,630 30	71,414	214,242	89,981 64
Morton.....	478	956	478 00	321	1,284	706 20
Nemaha.....	168,096	7,060,032	1,765,008 00	155,962	2,963,316	1,066,793 76
Neosho.....	60,388	1,328,536	332,134 00	70,714	1,626,422	569,247 70
Ness.....	7,347	36,735	14,694 00	8,001		
Norton.....	102,401	716,807	215,042 10	149,197	447,591	223,795 50
Osage.....	114,939	3,218,292	836,755 92	131,181	1,705,353	545,712 96
Osborne.....	66,678	1,133,526	272,046 20	78,325	324,975	93,990 00
Ottawa.....	71,282	712,820	213,846 00	72,732	363,660	152,737 20
Pawnee.....	13,786	137,860	48,251 00	13,557	6,778	2,711 20
Phillips.....	109,872	878,976	219,744 00	116,872	350,616	164,789 52
Pottawatomie.....	121,659	3,041,475	882,027 75	113,025	678,150	237,352 50
Pratt.....	33,638	100,914	38,347 32	36,699	220,194	77,067 90
Rawlins.....	53,762	537,620	139,781 20	60,712	182,136	81,961 20
Reno.....	139,775	1,817,075	508,781 00	162,645	2,114,385	909,185 55
Republic.....	164,261	1,806,871	542,061 30	147,764	443,292	190,615 56
Rice.....	77,503	620,024	173,606 72	78,852	315,408	119,855 04
Riley.....	67,111	1,744,886	471,119 22	66,931	267,724	107,089 60
Rooks.....	46,270	925,400	231,350 00	44,284	177,136	74,397 12
Rush.....	19,090	76,360	25,198 80	14,163	14,163	5,665 20
Russell.....	50,175	501,750	135,472 50	34,375	103,125	49,500 00
Saline.....	44,942	449,420	134,826 00	49,256	49,256	18,717 28
Scott.....	615			908		
Sedgwick.....	118,996	1,189,968	333,188 80	138,652	1,247,868	474,189 84
Seward.....	3,116	9,334	4,674 00	885		
Shawnee.....	92,892	2,879,652	777,506 04	89,784	1,885,464	678,767 04
Sheridan.....	8,562	59,934	19,178 88	24,761		
Sherman.....	28,415	340,980	109,113 60	27,003		
Smith.....	143,624	1,579,864	394,966 00	140,672	422,016	173,026 56
Stafford.....	43,792	306,544	101,159 52	59,831	299,155	101,712 70
Stanton.....	5,280			813	4,065	1,829 25
Stevens.....	2,138			819	4,095	2,252 25
Sumner.....	103,262	826,096	280,872 64	100,117	500,585	225,263 25
Thomas.....	35,692	178,460	53,538 00	26,911	13,445	5,382 00
Trego.....	13,093	78,558	25,138 56	9,084	18,168	7,630 56
Wabaunsee.....	89,719	2,512,132	678,275 64	89,894	719,152	316,426 88
Wallace.....	8,677	17,354	6,073 90	9,244		
Washington.....	169,444	4,066,656	1,016,664 00	181,945	1,273,615	483,973 70
Wichita.....	3,546			3,642		
Wilson.....	71,452	1,000,328	300,098 40	73,710	1,105,650	451,316 50
Woodson.....	50,583	708,162	198,285 36	47,854	1,004,934	412,022 94
Wyandotte.....	12,395	433,825	130,147 50	12,038	385,216	165,642 88
Totals.....	6,172,462	118,624,369	\$32,621,762 62	6,404,705	66,952,833	\$25,354,190 27

OATS.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	25,435	534,135	\$106,827 00	19,717	417,397	\$104,349 25
Anderson.....	23,138	578,450	115,690 00	14,635	269,284	72,706 68
Atchison.....	16,401	360,822	79,380 84	12,424	308,109	80,108 34
Barber.....	12,362	98,896	31,646 72	7,193	19,410	7,181 70
Barton.....	10,982	43,928	13,178 40	4,971	7,205	2,521 75
Bourbon.....	26,427	739,956	170,189 88	22,343	359,720	89,930 00
Brown.....	29,935	718,440	150,872 40	23,176	405,575	105,449 50
Butler.....	54,355	1,250,165	287,537 95	50,970	639,160	166,181 60
Chase.....	9,393	281,790	67,629 60	8,469	181,148	54,344 40
Chautauqua.....	11,653	314,631	66,072 51	13,037	271,154	67,788 50
Cherokee.....	25,398	558,756	139,689 90	26,422	554,850	149,809 50
Cheyenne.....	7,644	.....	.....	5,457	.....	.....
Clark.....	1,034	10,340	2,171 40	510	1,793	430 32
Clay.....	47,989	719,835	151,165 35	39,394	386,050	92,652 00
Cloud.....	44,712	536,544	128,770 56	33,836	289,290	81,001 20
Coffey.....	29,767	416,738	83,347 60	19,909	340,032	91,808 64
Comanche.....	1,893	13,251	4,240 32	674	1,210	484 00
Cowley.....	38,280	727,320	189,103 20	39,237	753,536	226,000 80
Crawford.....	26,153	679,978	142,795 38	24,740	712,512	171,002 88
Decatur.....	8,068	.....	.....	4,275	.....	.....
Dickinson.....	40,188	482,256	110,918 88	33,093	292,860	90,786 60
Doniphan.....	13,767	344,175	75,718 50	9,246	241,309	67,566 52
Douglas.....	11,433	342,990	89,177 40	8,746	186,088	55,826 40
Edwards.....	9,363	18,726	6,554 10	6,263	939	347 43
Elk.....	12,936	297,528	71,406 72	8,699	185,108	18,128 08
Ellis.....	5,994	.....	.....	3,630	3,192	1,053 36
Ellsworth.....	7,553	60,424	18,127 20	3,950	15,990	5,116 80
Finney.....	4,121	41,210	10,302 50	3,456	23,205	6,729 45
Ford.....	8,301	33,204	9,961 20	6,348	11,680	4,555 20
Franklin.....	15,355	307,100	70,633 00	9,876	182,700	51,156 00
Geary.....	9,145	146,320	30,727 20	8,445	164,160	45,964 80
Gove.....	2,165	.....	.....	698	.....	.....
Graham.....	4,525	18,100	5,430 00	3,104	9,312	3,072 96
Grant.....	923	.....	.....	278	216	62 64
Gray.....	1,421	.....	.....	645	320	232 00
Greeley.....	1,103	11,030	3,309 00	1,118	2,680	938 00
Greenwood.....	21,768	391,824	86,201 28	1,510	111,672	36,851 76
Hamilton.....	2,294	.....	.....	2,388	4,293	1,287 90
Harper.....	26,757	401,355	112,379 40	19,440	75,810	21,984 90
Harvey.....	26,493	450,381	117,099 06	25,479	278,222	83,466 60
Haskell.....	2,982	29,820	8,946 00	1,186	1,660	498 00
Hodgeman.....	2,846	.....	.....	1,405	.....	.....
Jackson.....	20,498	327,968	68,873 28	17,684	318,312	79,578 00
Jefferson.....	20,708	393,452	78,690 40	18,253	322,712	83,905 15
Jewell.....	39,906	359,154	82,605 42	27,500	123,750	34,650 00
Johnson.....	24,112	313,456	65,825 76	18,027	331,683	89,554 41
Kearny.....	2,642	26,420	6,605 00	2,215	6,372	1,911 60
Kingman.....	18,053	108,318	27,079 50	13,234	53,992	15,117 76
Kiowa.....	4,299	.....	.....	1,224	915	320 25
Labette.....	30,667	858,676	171,735 20	33,459	632,367	183,386 43
Lane.....	1,937	.....	.....	1,537	3,928	1,178 40
Leavenworth.....	10,307	206,140	53,596 40	9,787	135,639	40,691 70
Lincoln.....	9,650	.....	.....	3,578	3,220	1,191 40
Linn.....	22,570	564,250	118,492 50	33,777	891,690	231,839 40
Logan.....	5,135	.....	.....	3,351	1,675	670 00
Lyon.....	16,773	369,006	103,321 68	12,459	242,940	77,740 80
Marion.....	44,881	673,215	154,839 45	39,363	590,440	165,323 20
Marshall.....	35,724	785,928	172,904 16	36,591	759,250	204,997 50
McPherson.....	39,537	632,592	164,473 92	33,824	236,768	63,927 36
Meade.....	934	7,472	2,988 80	310	1,807	542 10
Miami.....	22,261	445,220	97,948 40	24,205	562,032	157,368 96
Mitchell.....	19,277	289,155	69,397 20	12,386	104,034	31,210 20
Montgomery.....	21,237	573,399	131,881 77	21,158	428,150	118,482 00
Morris.....	22,234	333,510	73,372 20	16,644	189,740	55,024 60
Morton.....	1,246	.....	.....	308	240	84 00
Nemaha.....	31,835	764,040	152,808 00	25,690	307,234	82,953 18
Neosho.....	29,937	538,886	107,773 20	29,479	488,160	126,921 60
Ness.....	3,079	.....	.....	2,170	210	63 00
Norton.....	10,985	.....	.....	11,072	220	74 80
Osage.....	20,917	439,257	92,243 97	13,737	226,644	63,460 32
Osborne.....	10,547	.....	.....	5,792	11,584	3,938 56
Ottawa.....	16,887	101,322	27,356 94	9,600	21,888	7,004 16
Pawnee.....	8,229	65,832	23,041 20	6,028	9,762	3,123 84
Phillips.....	14,976	224,640	51,667 20	9,931	61,570	20,933 80
Pottawatomie.....	22,080	574,080	126,297 60	17,250	285,648	77,124 96

OATS — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....	16,872	253,080	\$75,924 00	8,670	35,277	\$10,583 10
Rawlins.....	9,883	59,298	14,824 50	7,200	720	244 80
Reno.....	35,781	465,153	102,333 66	30,028	109,298	32,789 40
Republic.....	37,192	409,112	102,278 00	26,950	169,776	50,932 80
Rice.....	17,447	174,470	45,362 20	13,103	19,650	5,698 50
Riley.....	22,945	527,735	116,101 70	17,865	336,927	94,339 56
Rooks.....	13,115	65,575	19,672 50	8,934	39,303	13,756 05
Rush.....	7,678	.....	.....	4,142	13,912	4,869 20
Russell.....	5,733	.....	.....	2,833	3,392	1,153 28
Salline.....	15,289	229,335	59,627 10	13,683	52,536	18,387 60
Scott.....	3,329	.....	.....	2,869	13,770	5,094 90
Sedgwick.....	54,980	879,680	219,920 00	55,990	436,710	139,747 20
Seward.....	1,067	.....	.....	382	3,430	1,269 10
Shawnee.....	12,317	246,340	56,658 20	9,470	160,402	44,912 56
Sheridan.....	4,278	.....	.....	2,912	.....	.....
Sherman.....	7,700	53,900	14,553 00	5,041	.....	.....
Smith.....	27,645	55,290	13,822 50	15,993	55,970	17,350 70
Stafford.....	9,127	136,905	38,333 40	5,767	10,608	3,182 40
Stanton.....	2,060	.....	.....	223	.....	.....
Stevens.....	2,051	.....	.....	707	536	127 68
Sumner.....	46,778	1,029,116	277,861 32	43,943	449,968	125,991 04
Thomas.....	10,504	126,048	31,512 00	5,698	3,416	1,127 28
Trego.....	3,726	.....	.....	3,357	3,860	1,273 80
Wabunsee.....	10,430	177,319	39,008 20	7,153	78,780	22,846 20
Wallace.....	2,816	.....	.....	2,381	.....	.....
Washington.....	52,519	630,228	126,045 60	42,623	716,064	200,497 92
Wichita.....	1,629	.....	.....	1,784	5,352	1,605 60
Wilson.....	19,841	376,979	75,395 80	18,967	307,675	79,995 50
Woodson.....	14,052	295,092	59,018 40	10,343	232,700	65,156 00
Wyandotte.....	1,951	68,285	17,071 25	2,408	67,410	24,941 70
Totals.....	1,758,127	28,194,717	\$6,488,342 03	1,427,444	18,385,469	\$5,081,543 74

RYE.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	248	3,720	\$1,674 00	187	1,496	\$873 20
Anderson.....	241	1,928	771 20	259	3,108	1,460 76
Atchison.....	283	4,528	1,811 20	538	8,608	3,959 68
Barber.....	773	.....	.....	464	4,640	1,995 20
Barton.....	3,478	13,912	4,869 20	1,900	5,700	2,280 00
Bourbon.....	303	4,545	2,045 25	328	4,920	1,968 00
Brown.....	604	9,664	3,652 32	1,562	29,678	10,684 08
Butler.....	903	16,254	5,688 90	467	4,670	1,868 00
Chase.....	263	3,945	1,775 25	343	3,430	1,440 60
Chautauqua.....	94	1,880	827 20	75	1,125	506 25
Cherokee.....	87	1,044	574 20	19	190	76 00
Cheyenne.....	2,236	20,124	8,049 60	1,804	.....	.....
Clark.....	1,172	7,032	2,672 16	1,125	9,000	4,050 00
Clay.....	1,359	20,385	8,154 00	931	13,034	5,865 30
Cloud.....	1,189	11,890	4,399 30	713	5,704	2,281 60
Coffey.....	463	6,945	3,125 25	296	3,848	1,654 64
Comanche.....	1,306	6,530	2,481 40	799	3,196	1,182 52
Cowley.....	410	8,610	3,874 50	317	3,170	1,268 00
Crawford.....	102	1,530	841 50	88	1,408	563 20
Decatur.....	4,214	.....	.....	3,245	.....	.....
Dickinson.....	5,050	60,600	22,422 00	4,236	42,360	16,944 00
Doniphan.....	291	4,365	1,746 00	545	10,355	3,934 90
Douglas.....	502	8,032	4,016 00	653	11,754	5,641 92
Edwards.....	1,071	5,355	1,874 25	760	3,040	1,216 00
Elk.....	1,774	26,610	10,644 00	25	250	107 50
Ellis.....	3,485	.....	.....	2,356	47,120	19,790 40
Ellsworth.....	2,034	10,170	3,356 10	1,548	15,480	5,882 40
Finney.....	1,470	7,350	2,940 00	601	5,409	2,001 33
Ford.....	3,463	17,315	6,926 00	2,773	13,865	6,100 60
Franklin.....	230	.....	.....	395	7,110	3,199 50
Geary.....	922	11,986	4,075 24	606	10,908	4,799 52

RYE—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Gove.....	2,950			3,159	9,477	\$4,264 65
Graham.....	6,493	19,479	\$9,739 50	4,232	25,392	10,664 64
Grant.....	1,559			430	1,720	774 00
Gray.....	1,340			455	455	182 00
Greeley.....	1,385			476		
Greenwood.....	269	4,304	2,152 00	175	2,100	882 00
Hamilton.....	687			352	352	140 80
Harper.....	277	2,770	1,108 00	153	1,530	612 00
Harvey.....	900	14,400	4,472 00	1,300	11,700	4,329 00
Haskell.....	825	3,300	1,584 00	899	2,697	1,159 71
Hodgeman.....	3,087			2,640	2,640	1,056 00
Jackson.....	381	5,715	2,171 70	1,107	16,605	7,306 20
Jefferson.....	512	9,216	3,686 40	878	14,926	6,418 18
Jewell.....	4,284	21,420	8,139 60	1,668	8,340	3,419 40
Johnson.....	241	2,651	1,192 95	490	8,820	3,616 20
Kearny.....	664			286	286	128 70
Kingman.....	405			286	2,860	1,029 60
Kiowa.....	1,344	6,720	2,688 00	1,224	3,672	1,468 80
Labette.....	537	6,444	2,770 92	306	5,202	2,080 80
Lane.....	955			476	2,380	952 00
Leavenworth.....	635			444	9,768	2,930 40
Lincoln.....	2,102	10,510	4,204 00	676	5,408	1,892 80
Linn.....	207	3,105	1,304 10	150	2,550	1,122 00
Logan.....	2,444			1,127	2,254	1,014 30
Lyon.....	863	8,680	3,710 90	366	5,124	2,305 80
Marion.....	3,038	30,380	12,152 00	2,676	24,084	10,837 80
Marshall.....	454	6,356	2,542 40	1,697	35,637	14,254 80
McPherson.....	2,882	23,056	7,377 92	2,697	24,273	9,709 20
Meade.....	2,379	11,895	4,520 10	1,811	14,488	5,795 20
Miami.....	293			397	6,749	2,969 56
Mitchell.....	3,347	20,082	6,627 06	1,350	8,100	3,078 00
Montgomery.....	355	4,615	2,307 50	819	10,647	4,045 86
Morris.....	1,358	14,938	5,676 44	764	11,460	5,157 00
Morton.....	1,774			748	3,740	1,870 00
Nemaha.....	986	15,776	6,310 40	1,854	29,664	12,458 88
Neosho.....	263			314	4,082	1,632 80
Ness.....	3,002			1,621	4,863	2,138 35
Norton.....	7,810			5,285	15,855	7,134 75
Osage.....	501	6,513	2,800 69	347	3,123	1,467 81
Osborne.....	5,335	26,676	8,802 75	2,511	17,577	7,030 80
Ottawa.....	1,055	2,110	738 50	567	5,670	2,381 40
Pawnee.....	6,180	24,720	9,393 60	2,387	9,548	3,819 20
Phillips.....	8,741	69,928	23,775 52	5,999	41,993	17,637 06
Pottawatomie.....	1,062	19,116	7,264 08	760	12,920	5,555 63
Pratt.....	849	10,188	4,580 84	385	3,465	1,212 75
Rawlins.....	3,751			2,785	13,925	5,570 00
Reno.....	2,060	20,600	7,210 00	2,201	15,407	6,162 00
Republic.....	2,859	17,154	6,518 52	1,741	19,151	8,617 95
Rice.....	631	6,310	2,208 50	705	2,820	1,128 00
Riley.....	701	7,711	2,544 63	280	3,640	1,456 00
Rooks.....	4,474			1,964	13,748	6,186 60
Rush.....	3,100	12,400	4,712 00	2,323	6,969	2,787 60
Russell.....	5,825			3,129	18,774	8,260 56
Saline.....	3,093	55,674	21,156 12	2,523	32,799	11,151 66
Scott.....	977			436	872	279 04
Sedgwick.....	692	6,228	3,114 00	584	5,256	1,997 28
Seward.....	1,017			239	478	224 66
Shawnee.....	543	8,145	4,072 50	243	3,402	1,360 80
Sheridan.....	3,074			1,564	4,692	2,346 00
Sherman.....	9,662	48,310	17,391 60	6,389	19,167	8,050 14
Smith.....	8,856	61,992	26,656 56	4,497	31,479	12,906 39
Stafford.....	1,213	9,704	3,687 52	1,368	12,312	4,924 80
Stanton.....	1,941			507	2,535	1,090 05
Stevens.....	1,189			229		
Sumner.....	1,038	12,456	4,982 40	830	8,300	3,154 00
Thomas.....	6,400	51,200	19,456 00	3,140	6,280	3,140 00
Trego.....	2,593			1,344	4,032	1,612 80
Wabaunsee.....	534	5,874	2,055 90	104	1,456	684 32
Wallace.....	1,610			463	463	208 35
Washington.....	1,820	18,200	7,644 00	1,365	19,110	8,599 50
Wichita.....	657			388	1,940	873 00
Wilson.....	1,095	14,235	6,121 05	724	11,584	4,633 60
Woodson.....	213	4,047	1,821 15	247	6,175	2,778 75
Wyandotte.....	69	1,518	576 84	120	3,120	1,466 40
Totals.....	198,717	1,063,019	\$410,809 08	131,134	978,658	\$404,982 98

BARLEY.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	77	1,155	\$519 75	1	20	\$8 00
Anderson.....	135	1,215	546 75	51	612	244 80
Atchison.....	52	1,040	468 60	140	2,800	1,120 00
Barber.....	2,452			1,038	12,456	5,605 20
Barton.....	5,436			2,111	8,444	3,377 60
Bourbon.....	10			14	140	56 00
Brown.....	684	17,100	6,156 00	427	6,405	2,562 00
Butler.....	57			30	240	96 00
Chase.....				220	3,300	1,320 00
Chautauqua.....	10					
Cherokee.....						
Cheyenne.....	4,805	9,610	3,844 00	2,089		
Clark.....	4,512	45,120	13,536 00	2,224	15,568	6,227 20
Clay.....	20			23	345	138 00
Cloud.....	93	1,395	627 75	13	130	52 00
Coffey.....	12					
Comanche.....	2,960	23,680	7,814 40	1,178	7,068	2,827 20
Cowley.....	132	2,376	1,069 20	70	700	280 00
Crawford.....						
Decatur.....	942			566		
Dickinson.....	404	4,849	1,454 70	113	2,034	915 30
Doniphan.....	523	10,460	3,347 20	379	16,701	7,181 43
Douglas.....				9	144	57 60
Edwards.....	2,320	4,640	1,856 00	1,274	5,096	1,783 60
Elk.....	3,637					
Ellis.....	6,639			3,499	24,493	9,797 20
Ellsworth.....	713			53	265	106 00
Finney.....	3,453			3,589	35,890	15,432 70
Ford.....	7,794	31,176	11,535 12	3,995	23,970	10,307 10
Franklin.....	8	144	57 60	38	608	243 20
Geary.....	37	629	239 02	59	826	346 92
Gove.....	6,142			3,258	16,290	733 50
Graham.....	4,535	22,675	10,203 75	1,598	7,990	3,435 70
Grant.....	1,327			165	2,145	858 00
Gray.....	4,741			2,135		
Greeley.....	2,251			1,514		
Greenwood.....	10	240	96 00	77	770	308 00
Hamilton.....	1,440			380	380	171 00
Harper.....	780			181	4,525	1,900 50
Harvey.....	44			85	340	136 00
Haskell.....	3,142	18,852	9,048 96	1,246	6,230	2,803 50
Hodgeman.....	7,125			3,754	7,508	3,378 60
Jackson.....	12					
Jefferson.....				4	40	16 00
Jewell.....	66					
Johnson.....	50	550	165 00	227	5,675	2,270 00
Kearny.....	1,681			638	3,828	1,416 36
Kingman.....	955	5,510	1,653 00	754	13,572	5,428 80
Kiowa.....	7,857			3,581	10,743	4,619 49
Labette.....	9			15	150	60 00
Lane.....	9,231			6,624	59,616	22,057 92
Leavenworth.....	7					
Lincoln.....	95			2	8	3 20
Linn.....	23			8	80	33 60
Logan.....	6,956	6,956	2,921 52	4,045	24,270	10,921 50
Lyon.....	140			30	900	360 00
Marion.....	299	4,485	1,794 00	252	5,040	2,016 00
Marshall.....	2	36	14 40	115	1,380	579 60
McPherson.....	394	3,940	1,576 00	456	1,824	729 60
Meade.....	4,940	49,400	19,760 00	2,951	35,412	13,456 56
Miami.....	105			58	580	232 00
Mitchell.....	68					
Montgomery.....	30	720	288 00	30	300	120 00
Morris.....	29			25	200	80 00
Morton.....	564			14		
Nemaha.....	113	2,034	711 90	77	1,386	554 40
Neosho.....	20			12	120	48 00
Ness.....	13,608			9,965	49,825	19,930 00
Norton.....	694			115	345	155 25
Osage.....	25			25	625	250 00
Osborne.....	697			174	522	208 80
Ottawa.....	41	82	36 90	5	15	6 00
Pawnee.....	7,805	31,220	10,302 60	3,662	14,648	5,859 20
Phillips.....	518	6,216	1,864 80	160	480	182 40
Pottawatomie.....	42					

BARLEY—CONCLUDED.

CROPS.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....	3,356	40,272	\$15,303 36	1,658	24,870	\$9,948 00
Rawlins.....	5,816			2,937		
Reno.....	288	2,880	1,152 00	220	880	352 00
Republic.....	31			4	16	6 40
Rice.....	55			45	315	141 75
Riley.....	11					
Rooks.....	4,202			2,205	4,410	1,764 00
Rush.....	7,232			5,216	15,648	5,789 76
Russell.....	2,486			1,253	6,265	2,443 35
Saline.....	54			29	116	46 40
Scott.....	3,839			2,908	11,632	4,071 20
Sedgwick.....	36			50	200	80 00
Seward.....	1,454	5,816	2,326 40	412	4,532	2,130 04
Shawnee.....				25	250	100 00
Sheridan.....	5,019	50,190	17,566 50	2,784		
Sherman.....	6,603			4,389		
Smith.....	277	1,385	457 05	76	380	152 00
Stafford.....	649			416	1,664	798 88
Stanton.....	1,590			111		
Stevens.....	1,720			173	1,730	778 50
Sumner.....	392			258	1,032	412 80
Thomas.....	7,457	44,742	14,317 44	3,363	13,452	6,053 40
Trego.....	3,880			1,947		
Wabaunsee.....	2			8	136	54 40
Wallace.....	3,773	15,092	7,244 16	1,851		
Washington.....	86					
Wichita.....	4,467			6,824	47,768	21,495 60
Wilson.....	41			108	1,080	486 00
Woodson.....	52					
Wyandotte.....						
Totals.....	201,378	467,882	\$171,875 83	111,390	582,393	\$232,509 01

BUCKWHEAT.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

CROPS.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	10	80	\$60 00	4	32	\$19 20
Anderson.....	15	120	90 00	3	24	14 40
Atchison.....	2	20	15 00			
Barber.....	4					
Barton.....						
Bourbon.....	19	152	114 00		80	48 00
Brown.....	26	208	156 00	41	328	196 80
Butler.....	57	342	256 50	15	120	72 00
Chase.....				20	160	96 00
Chautauqua.....	16	128	96 00			
Cherokee.....	31	248	186 00	38	304	182 40
Cheyenne.....	7	42	31 50	12	96	57 60
Clark.....						
Clay.....	12	120	90 00	4	32	19 20
Cloud.....	20	120	90 00	1	1	4 80
Coffey.....	44	352	264 00	8	84	38 40
Comanche.....						
Cowley.....	37	222	166 50	4	32	19 20
Crawford.....	13	78	58 50	119	952	571 20
Decatur.....	2			5	40	24 00
Dickinson.....	15	150	112 50	8	64	38 40
Doniphan.....	23	230	172 50	5	40	24 00
Douglas.....	23	230	172 50			
Edwards.....						
Elk.....	22	176	132 00	7	56	33 60
Ellis.....				1	8	4 80
Ellsworth.....	3					
Finney.....						
Ford.....	1			1	8	4 80
Franklin.....	81	810	607 50	55	440	264 00
Geary.....	10	60	45 00	13	104	62 40

BUCKWHEAT—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Gove.....						
Graham.....	30			11	88	\$52 80
Grant.....						
Gray.....						
Greeley.....						
Greenwood.....	76	608	\$456 00	12	96	57 60
Hamilton.....	2			10	80	48 00
Harper.....						
Harvey.....	4	24	18 00	4	32	19 20
Haskell.....						
Hodgeman.....						
Jackson.....	42	336	252 00	22	176	105 60
Jefferson.....	5	40	30 00	13	104	62 40
Jewell.....	37	185	138 75	24	192	115 20
Johnson.....	12	120	90 00	152	1,216	729 60
Kearny.....				1	8	4 80
Kingman.....	11	44	33 00			
Kiowa.....						
Labette.....	2	16	12 00	5	40	24 00
Lane.....	2					
Leavenworth.....	30	300	225 00			
Lincoln.....						
Linn.....	51	510	382 50	5	40	24 00
Logan.....	1					
Lyon.....	119	1,190	892 50	91	728	436 80
Marion.....	4	32	24 00	3	24	14 40
Marshall.....	150	900	675 00	36	288	172 80
McPherson.....	10	60	45 00	22	176	105 60
Meade.....						
Miami.....	13	65	48 75			
Mitchell.....	3	15	11 25	12	96	57 60
Montgomery.....	11	66	49 50	4	32	19 20
Morris.....	8	96	72 00	1	8	4 80
Morton.....						
Nemaha.....	57	513	384 75	31	248	148 80
Neosho.....	19	171	128 25	2	16	9 60
Ness.....						
Norton.....	28	84	63 00	68	544	326 40
Osage.....	41	410	307 50	44	352	211 20
Osborne.....	17	136	102 00	39	312	187 20
Ottawa.....	15	75	56 25	6	48	28 80
Pawnee.....	13	39	29 25	9	72	43 20
Phillips.....	24	144	108 00	1	8	4 80
Pottawatomie.....	36	288	216 00	12	96	57 60
Pratt.....	4	12	9 00	32	256	153 60
Rawlins.....	12	72	54 00	1	8	4 80
Reno.....	1					
Republic.....	19	114	85 50	7	56	33 60
Rice.....	10	40	30 00			
Riley.....	19	114	85 50	41	328	196 80
Rooks.....	4	16	12 00	16	128	76 80
Rush.....						
Russell.....						
Saline.....	6	30	22 50	10	80	48 00
Scott.....						
Sedgwick.....	25	150	112 50	7	56	33 60
Seward.....						
Shawnee.....	22	220	165 00	1	8	4 80
Sheridan.....	3	12	9 00	14	112	67 20
Sherman.....	6	24	18 00	5	40	24 00
Smith.....	62	310	232 50	9	72	43 20
Stafford.....	7	70	52 50	15	120	72 00
Stanton.....						
Stevens.....						
Sumner.....	7	35	26 25	1	8	4 80
Thomas.....				6	48	28 80
Trego.....	5					
Wabaunsee.....	52	468	351 00	23	184	110 40
Wallace.....	1			7	56	33 60
Washington.....	55	330	247 50	58	464	278 40
Wichita.....						
Wilson.....				60	480	288 00
Woodson.....	1	6	4 50	8	64	38 40
Wyandotte.....						
Totals.....	1,687	12,378	\$9,283 50	1,335	10,680	\$6,408 00

IRISH POTATOES.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	514	51,400	\$32,382 00	727	65,430	\$37,295 10
Anderson.....	563	39,410	27,587 00	703	31,635	18,981 00
Atchison.....	1,954	224,710	157,297 00	2,821	174,902	73,458 84
Barber.....	268	8,040	8,040 00	171	8,892	8,891 00
Barton.....	953	47,650	39,547 50	893	44,650	40,185 00
Bourbon.....	895	80,550	48,330 00	1,088	87,040	43,520 00
Brown.....	1,083	72,561	52,243 92	1,268	53,256	30,355 92
Butler.....	921	30,393	22,794 75	1,195	28,680	24,951 60
Chase.....	499	13,972	9,780 40	603	33,165	27,195 30
Chautauqua.....	347	27,760	24,984 00	399	19,950	13,366 50
Cherokee.....	792	47,520	37,065 60	903	67,725	28,444 50
Cheyenne.....	767	15,340	13,499 20	705	28,200	28,200 00
Clark.....	48	1,440	1,339 20	30	750	675 00
Clay.....	982	14,730	11,784 00	2,035	26,455	19,841 25
Cloud.....	981	19,620	17,265 60	896	8,960	7,705 60
Coffey.....	813	40,650	26,422 50	1,011	62,682	39,489 66
Comanche.....	49	735	698 25	41	1,763	1,763 00
Cowley.....	1,009	42,378	30,512 16	1,218	60,900	45,675 00
Crawford.....	906	36,240	21,744 00	721	39,655	19,827 50
Decatur.....	1,030	41,200	28,840 00	1,002	30,060	22,545 00
Dickinson.....	1,002	37,074	30,771 42	1,046	52,300	33,995 00
Doniphan.....	1,403	91,195	50,157 25	2,126	116,930	56,126 40
Douglas.....	2,449	244,900	188,573 00	4,106	349,010	184,975 30
Edwards.....	255	10,200	10,200 00	242	2,420	2,105 40
Elk.....	388	9,700	9,700 00	644	33,488	21,767 20
Ellis.....	590	8,850	7,965 00	559	16,770	15,093 00
Ellsworth.....	555	19,425	16,705 50	488	5,856	5,036 16
Finney.....	188	9,400	9,400 00	235	14,100	10,998 00
Ford.....	335	3,350	3,015 00	215	3,870	3,483 00
Franklin.....	941	88,454	60,148 72	1,289	59,294	33,204 64
Geary.....	533	28,782	18,996 12	768	19,200	14,592 00
Gove.....	152	6,080	6,080 00	93	4,650	4,650 00
Graham.....	664	13,280	10,624 00	479	2,395	2,395 00
Grant.....	13	.....	.....	7	140	126 00
Gray.....	45	.....	.....	45	1,800	1,620 00
Greeley.....	102	.....	.....	65	2,600	2,340 00
Greenwood.....	771	46,260	42,559 20	879	45,708	34,281 00
Hamilton.....	95	.....	.....	29	1,160	1,044 00
Harper.....	564	19,740	19,740 00	283	11,320	10,188 00
Harvey.....	635	27,940	25,146 00	644	30,912	26,584 32
Haskell.....	26	.....	.....	11	110	110 00
Hodgeman.....	241	12,050	12,050 00	172	1,720	1,720 00
Jackson.....	1,038	67,470	40,482 00	1,283	53,885	31,792 74
Jefferson.....	1,643	131,440	65,720 00	3,630	199,650	103,818 00
Jewell.....	1,714	109,696	107,502 08	1,649	23,086	20,084 82
Johnson.....	1,462	106,726	59,766 56	2,993	197,538	94,818 24
Kearny.....	99	3,960	2,494 80	109	7,085	7,085 00
Kingman.....	351	.....	.....	249	4,482	2,689 20
Kiowa.....	66	.....	.....	240	4,800	4,800 00
Labette.....	407	16,280	11,396 00	635	50,800	25,400 00
Lane.....	134	.....	.....	114	1,140	1,140 00
Leavenworth.....	3,617	318,296	149,599 12	5,138	400,764	180,343 80
Lincoln.....	567	13,041	12,388 95	550	7,700	7,084 00
Linn.....	642	41,730	25,038 00	967	48,350	29,977 00
Logan.....	153	2,295	2,295 00	252	5,040	4,384 80
Lyon.....	937	70,275	54,111 75	1,586	137,982	75,890 10
Marion.....	1,340	53,600	48,240 00	1,284	51,360	43,656 00
Marshall.....	1,330	46,550	45,153 50	1,619	69,617	55,693 60
McPherson.....	1,309	65,450	52,360 00	1,351	40,530	30,397 50
Meade.....	51	1,020	1,020 00	48	1,920	1,920 00
Miami.....	955	61,120	39,728 00	4,363	349,040	183,481 60
Mitchell.....	980	36,260	31,183 60	786	9,432	8,771 76
Montgomery.....	407	30,118	24,094 40	524	32,488	19,492 80
Morris.....	600	18,000	13,500 00	644	20,608	14,219 52
Morton.....	9	.....	.....	4	120	114 00
Nemaha.....	1,348	90,316	65,930 68	1,740	67,860	46,144 80
Neosho.....	471	13,188	9,891 00	657	37,449	18,724 50
Ness.....	224	11,200	11,200 00	250	3,750	3,375 00
Norton.....	911	18,220	11,843 00	1,201	48,040	39,873 20
Osage.....	1,630	107,580	77,457 60	1,287	90,090	43,243 20
Osborne.....	875	26,250	19,687 50	831	8,310	7,146 60
Ottawa.....	847	21,425	18,211 25	584	9,340	7,101 40
Pawnee.....	259	.....	.....	244	6,100	5,185 00
Phillips.....	1,419	39,732	32,977 56	1,133	22,660	18,128 00
Pottawatomie.....	1,121	93,043	65,130 10	1,140	14,820	9,781 20

IRISH POTATOES—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....	340	16,320	\$12,729 60	125	3,750	\$3,187 50
Rawlins.....	1,027	28,756	17,253 60	964	23,136	19,896 96
Reno.....	1,065	26,625	21,300 00	785	32,185	23,495 05
Republic.....	1,637	29,466	26,519 40	1,123	12,343	8,886 96
Rice.....	908	54,480	51,211 20	690	10,340	9,306 69
Riley.....	997	34,895	27,218 10	663	18,564	15,222 48
Rooks.....	584	37,960	22,776 00	684	37,620	33,858 00
Rush.....	363	2,904	2,119 92	326	3,260	3,097 00
Russell.....	501	9,018	7,665 30	578	23,120	18,958 40
Saline.....	870	46,110	39,193 50	868	8,680	6,249 60
Scott.....	87	.....	.....	67	670	603 00
Sedgwick.....	1,125	33,750	27,000 00	1,195	17,925	13,443 75
Seward.....	28	.....	.....	11	55	55 00
Shawnee.....	1,970	165,480	91,014 00	3,994	203,694	91,662 30
Sheridan.....	403	14,105	10,578 75	370	3,700	3,330 00
Sherman.....	997	54,835	47,158 10	693	6,930	6,237 00
Smith.....	1,522	50,226	39,678 54	1,304	18,256	16,247 84
Stafford.....	244	6,100	5,612 00	214	2,140	2,140 00
Stanton.....	38	.....	.....	4	200	203 00
Stevens.....	29	.....	.....	9	180	180 00
Sumner.....	1,075	37,625	34,991 25	851	19,573	14,875 48
Thomas.....	644	6,440	3,864 00	449	4,490	4,041 00
Trego.....	313	7,825	6,886 00	238	5,950	5,353 00
Wabunsee.....	931	40,964	24,578 40	1,168	70,080	38,544 00
Wallace.....	126	.....	.....	69	3,450	2,760 00
Washington.....	1,549	15,490	15,490 00	1,611	41,886	37,697 40
Wichita.....	144	.....	.....	52	2,600	2,340 00
Wilson.....	348	13,920	11,414 40	604	27,180	17,938 80
Woodson.....	466	18,640	13,980 00	826	66,080	40,969 60
Wyandotte.....	4,239	317,925	158,962 50	8,135	650,800	533,656 00
Totals.....	80,817	4,217,119	\$2,951,587 30	100,610	4,995,181	\$3,123,993 69

SWEET POTATOES.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	3	300	\$300 00	7	1,050	\$619 50
Anderson.....	11	660	660 00	15	750	420 00
Atchison.....	45	3,825	3,825 00	48	2,880	2,880 00
Barber.....	44	1,452	1,452 00	16	1,600	1,760 00
Barton.....	9	297	297 00	5	250	250 00
Bourbon.....	14	1,400	1,400 00	17	1,530	1,530 00
Brown.....	5	365	365 00	2	250	200 00
Butler.....	56	3,080	3,080 00	34	1,870	1,159 40
Chase.....	11	880	880 00	23	920	800 40
Chautauqua.....	35	3,850	3,850 00	44	2,728	2,591 60
Cherokee.....	181	14,118	14,118 00	179	24,165	10,149 30
Cheyenne.....	.....	.....	.....	2	100	100 00
Clark.....	20	1,500	1,500 00	2	114	125 40
Clay.....	12	300	300 00	4	1,000	900 00
Cloud.....	7	140	140 00	31	310	310 00
Coffey.....	18	1,260	1,260 00	13	1,014	790 92
Comanche.....	18	360	360 00	9	513	538 65
Cowley.....	117	2,691	2,691 00	148	14,800	8,880 00
Crawford.....	68	2,584	2,584 00	33	3,135	1,786 95
Decatur.....	.....	.....	.....	.....	.....	.....
Dickinson.....	49	3,773	3,773 00	60	3,000	2,610 00
Doniphan.....	9	900	900 00	11	1,100	1,100 00
Douglas.....	170	18,700	18,700 00	199	31,840	15,920 00
Edwards.....	13	390	390 00	4	160	147 20
Elk.....	16	960	960 00	16	768	460 80
Ellis.....	2	.....	.....	1	60	60 00
Ellsworth.....	12	756	756 00	14	658	592 20
Finney.....	115	11,500	11,500 00	138	14,490	11,302 20
Ford.....	9	432	432 00	5	215	215 00
Franklin.....	56	6,720	6,720 00	20	2,100	1,512 00
Geary.....	56	4,928	4,928 00	23	1,265	1,189 10

SWEET POTATOES—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Gove.....				4	40	\$40 00
Graham.....	8	360	\$360 00	18	180	180 00
Grant.....	2			2	200	160 00
Gray.....	5			6	240	240 00
Greeley.....						
Greenwood.....	31	2,325	2,325 00	20	1,400	1,218 00
Hamilton.....	31	2,325	2,325 00	18	900	900 00
Harper.....	40	3,000	3,000 00	11	550	495 00
Harvey.....	8	400	400 00	19	1,824	1,605 12
Haskell.....	1			5	125	125 00
Hodgeman.....	2	150	150 00	1	40	36 00
Jackson.....	7	700	700 00	1	32	27 84
Jefferson.....	22	2,420	2,420 00	53	4,770	2,480 40
Jewell.....	3	150	150 00			
Johnson.....	47	3,290	3,290 00	59	4,484	2,959 44
Kearny.....	15	1,500	1,500 00	23	1,219	707 02
Kingman.....	3	150	150 00	5	250	200 00
Kiowa.....	4	200	200 00	6	336	369 60
Labette.....	78	5,850	5,850 00	85	8,075	4,037 50
Lane.....	2	100	100 00	4	80	80 00
Leavenworth.....	109	5,450	5,450 00	127	5,080	1,778 00
Lincoln.....	19	608	608 00	13	1,300	910 00
Linn.....	11	660	660 00	10	500	360 00
Logan.....	1			4	160	160 00
Lyon.....	281	28,100	28,100 00	57	5,700	5,700 00
Marion.....	26	1,820	1,820 00	5	225	193 50
Marshall.....	5	440	440 00	10	590	531 00
McPherson.....	21	2,100	2,100 00	25	2,500	2,500 00
Meade.....	16	800	800 00	6	522	522 00
Miami.....	37	2,146	2,146 00	23	2,645	1,322 50
Mitchell.....	4	132	132 00	6	90	72 00
Montgomery.....	62	6,200	6,200 00	53	2,915	2,040 50
Morris.....	10	450	450 00	3	159	151 05
Morton.....				2	60	60 00
Nemaha.....	8	800	800 00	17	850	654 50
Neosho.....	9	585	585 00	7	525	393 75
Ness.....	11	385	385 00	3	30	30 00
Norton.....				6	60	54 00
Osage.....	75	6,000	6,000 00	12	1,056	760 32
Osborne.....	5	125	125 00	5	50	50 00
Ottawa.....	4	120	120 00	6	174	130 50
Pawnee.....	15	750	750 00	27	540	540 00
Phillips.....	2	46	46 00	1	6	7 20
Pottawatomie.....	17	2,125	2,125 00	72	12,600	6,300 00
Pratt.....	10	250	250 00	19	760	684 00
Rawlins.....	3	120	120 00	1	5	3 75
Reno.....	112	5,600	5,600 00	68	3,740	2,879 80
Republic.....	11	440	440 00	2	90	90 00
Rice.....	11	550	550 00	156	7,956	5,967 00
Riley.....	101	6,565	6,565 00	106	6,678	6,678 00
Rooks.....	8	600	600 00	6	390	468 00
Rush.....				2	40	20 00
Russell.....	2			3	186	167 40
Saline.....	29	1,450	1,450 00	30	300	225 00
Scott.....				1	10	9 00
Sedgwick.....	156	9,360	9,360 00	553	16,590	8,295 00
Seward.....	7	280	280 00	3	120	150 00
Shawnee.....	301	33,119	33,110 00	440	17,600	7,040 00
Sheridan.....	2					
Sherman.....	3			5	50	45 00
Smith.....	3	60	60 00	3	33	33 00
Stafford.....	99	4,950	4,950 00	17	1,275	1,402 50
Stanton.....	11	550	550 00			
Stevens.....	5	250	250 00	8	400	400 00
Sumner.....	97	4,850	4,850 00	53	1,961	1,313 87
Thomas.....						
Trego.....	20	1,000	1,000 00	21	525	472 50
Wabaunsee.....	237	23,700	23,700 00	479	29,698	14,849 00
Wallace.....						
Washington.....	17	850	850 00	12	300	300 00
Wichita.....	1			1	50	50 00
Wilson.....	4	120	120 00	5	300	240 00
Woodson.....	6	450	450 00	8	1,200	744 00
Wyandotte.....	314	47,100	47,100 00	472	59,080	30,680 00
Totals.....	3,808	313,088	\$313,088 00	4,437	326,974	\$195,189 18

SORGHUM, 1893.

TABLE showing the number of acres, product, and value.

COUNTIES.	Acres planted.	Acres manu- factured into syrup.	Gallons of syrup.	Value of syrup.	Acres of forage.	Value of forage.	Total value of crop.
Allen.....	427	362	21,720	\$8,688 00	65	\$325 00	\$9,013 00
Anderson.....	341	272	13,600	5,440 00	69	345 00	5,785 00
Atchison.....	47	37	1,850	740 00	10	50 00	790 00
Barber.....	6,319	3,159	126,360	50,544 00	3,160	25,280 00	75,824 00
Barton.....	1,487	743	37,150	14,860 00	744	4,464 00	19,324 00
Bourbon.....	1,824	1,732	173,200	69,280 00	92	460 00	69,740 00
Brown.....	27	16	1,600	640 00	11	88 00	728 00
Butler.....	3,539	2,639	107,960	43,184 00	900	9,000 00	52,184 00
Chase.....	1,003	702	42,120	16,848 00	301	1,501 00	18,349 00
Chautauqua.....	822	509	33,085	13,234 00	313	1,252 00	14,486 00
Cherokee.....	361	314	20,410	8,164 00	47	141 00	8,305 00
Cheyenne.....	2,782	278	11,120	4,448 00	2,504	5,008 00	9,456 00
Clark.....	1,606	160	11,200	4,480 00	1,446	7,230 00	11,710 00
Clay.....	990	425	25,500	10,200 00	565	5,650 00	15,850 00
Cloud.....	1,986	218	10,900	4,360 00	1,768	21,216 00	25,576 00
Coffey.....	910	618	27,280	10,912 00	228	1,368 00	12,280 00
Comanche.....	1,616	161	8,050	3,220 00	1,455	7,275 00	10,495 00
Cowley.....	1,789	143	5,720	2,288 00	1,646	6,584 00	8,872 00
Crawford.....	199	145	7,250	2,900 00	54	216 00	3,116 00
Decatur.....	1,131	169	3,380	1,352 00	962	4,810 00	6,162 00
Dickinson.....	2,533	101	4,545	1,818 00	2,432	17,024 00	18,842 00
Doniphan.....	45	45	4,500	1,800 00	.....	.....	1,800 00
Douglas.....	184	9	900	360 00	175	875 00	1,235 00
Edwards.....	2,269	113	4,520	1,808 00	2,156	17,248 00	19,056 00
Elk.....	3,416	1,366	47,810	19,124 00	2,050	12,300 00	31,424 00
Ellis.....	4,587	229	6,870	2,748 00	4,358	26,148 00	28,896 00
Ellsworth.....	2,868	114	3,420	1,368 00	2,754	16,524 00	17,892 00
Finney.....	3,743	187	5,610	2,244 00	3,556	17,780 00	20,024 00
Ford.....	2,948	58	2,030	812 00	2,890	14,450 00	15,262 00
Franklin.....	325	302	19,630	7,852 00	23	138 00	7,990 00
Geary.....	216	47	2,820	1,128 00	169	1,014 00	2,142 00
Gove.....	4,038	403	24,180	9,672 00	3,635	18,175 00	27,847 00
Graham.....	1,823	145	4,350	1,740 00	1,678	8,390 00	10,130 00
Grant.....	1,687	84	4,200	1,680 00	1,603	12,824 00	14,504 00
Gray.....	2,187	218	8,720	3,488 00	1,969	15,752 00	19,240 00
Greeley.....	1,578	157	6,280	2,512 00	1,421	11,368 00	13,880 00
Greenwood.....	4,033	120	1,200	480 00	3,913	15,652 00	16,132 00
Hamilton.....	2,773	27	1,350	540 00	2,746	16,476 00	17,016 00
Harper.....	379	284	24,140	9,656 00	95	760 00	10,416 00
Harvey.....	1,386	207	8,280	3,312 00	1,179	5,895 00	9,207 00
Haskell.....	2,302	23	1,380	552 00	2,279	15,953 00	16,505 00
Hodgeman.....	5,477	2,190	87,600	35,040 00	3,287	23,009 00	58,049 00
Jackson.....	120	120	7,200	2,880 00	.....	.....	2,880 00
Jefferson.....	250	210	18,900	7,560 00	40	240 00	7,800 00
Jewell.....	1,104	662	36,410	14,564 00	442	2,210 00	16,774 00
Johnson.....	139	132	13,200	5,280 00	7	35 00	5,315 00
Kearny.....	1,743	87	3,480	1,392 00	1,656	13,248 00	14,640 00
Kingman.....	486	243	9,720	3,888 00	243	1,701 00	5,589 00
Kiowa.....	2,235	223	6,690	2,676 00	2,012	14,084 00	16,760 00
Labette.....	360	270	16,200	6,480 00	90	450 00	6,930 00
Lane.....	2,967	59	2,950	1,180 00	2,908	14,540 00	15,720 00
Leavenworth.....	492	467	46,700	18,680 00	25	125 00	18,805 00
Lincoln.....	2,554	638	22,330	8,932 00	1,916	7,664 00	16,596 00
Linn.....	270	218	19,620	7,848 00	52	208 00	8,056 00
Logan.....	3,484	348	17,400	6,960 00	3,136	21,952 00	28,912 00
Lyon.....	1,272	546	43,680	17,472 00	726	2,904 00	20,376 00
Marion.....	2,836	198	9,900	3,960 00	2,638	18,466 00	22,426 00
Marshall.....	338	185	15,725	6,290 00	153	918 00	7,208 00
McPherson.....	1,397	698	52,350	20,940 00	699	6,990 00	27,930 00
Meade.....	2,368	236	9,440	3,776 00	2,132	14,924 00	18,700 00
Miami.....	225	164	6,560	2,624 00	61	305 00	2,929 00
Mitchell.....	769	130	11,700	4,680 00	639	5,112 00	9,792 00
Montgomery.....	643	437	21,850	8,740 00	206	1,648 00	10,388 00
Morris.....	596	95	4,750	1,900 00	501	3,006 00	4,966 00
Morton.....	1,612	16	480	192 00	1,596	7,980 00	8,172 00
Nemaha.....	163	163	14,670	5,868 00	.....	.....	5,868 00
Neosho.....	503	452	29,380	11,752 00	51	153 00	11,905 00
Ness.....	4,919	1,278	38,340	15,336 00	3,641	21,846 00	37,182 00
Norton.....	1,148	459	27,540	11,016 00	689	3,445 00	14,461 00
Osage.....	2,049	1,598	143,820	57,528 00	451	3,608 00	61,136 00
Osborne.....	987	493	9,860	3,944 00	494	2,270 00	6,214 00
Ottawa.....	3,664	109	5,450	2,180 00	3,555	17,775 00	19,955 00
Pawnee.....	3,973	397	23,820	9,528 00	3,576	21,456 00	30,984 00
Phillips.....	815	228	6,840	2,736 00	587	4,109 00	6,845 00
Pottawatomie.....	213	191	13,370	5,348 00	22	198 00	5,546 00

SORGHUM, 1893—CONCLUDED.

COUNTIES.	Acres planted.	Acres manufactured into syrup.	Gallons of syrup.	Value of syrup.	Acres of forage.	Value of forage.	Total value of crop.
Pratt.....	540	486	19,440	\$7,776 00	54	\$324 00	\$8,100 00
Rawlins.....	1,737	173	14,705	5,882 00	1,564	10,948 00	16,830 00
Reno.....	877	175	11,375	4,550 00	702	4,914 00	9,464 00
Republic.....	469	422	37,980	15,192 00	47	235 00	15,427 00
Rice.....	479	239	11,950	4,780 00	240	2,160 00	6,940 00
Riley.....	310	71	4,260	1,704 00	239	1,912 00	3,616 00
Rooks.....	1,606	160	6,400	2,560 00	1,446	14,460 00	17,020 00
Rush.....	4,464	357	21,420	8,568 00	4,107	16,428 00	24,996 00
Russell.....	4,644	92	8,280	3,312 00	4,552	22,760 00	26,072 00
Saline.....	2,016	201	16,080	6,432 00	1,815	10,890 00	17,322 00
Scott.....	2,748	274	10,960	4,384 00	2,474	14,844 00	19,228 00
Sedgwick.....	651	325	22,750	9,100 00	326	2,608 00	11,708 00
Seward.....	1,290	64	3,840	1,536 00	1,226	7,356 00	8,892 00
Shawnee.....	739	443	44,300	17,720 00	296	2,368 00	20,088 00
Sheridan.....	1,545	463	37,040	14,816 00	1,082	6,492 00	21,308 00
Sherman.....	3,745	861	68,880	27,552 00	2,884	14,420 00	41,972 00
Smith.....	165	49	3,675	1,470 00	116	696 00	2,166 00
Stafford.....	1,145	858	34,320	13,728 00	287	1,435 00	15,163 00
Stanton.....	2,146	214	8,560	3,424 00	1,932	9,660 00	13,084 00
Stevens.....	1,661	166	8,300	3,320 00	1,495	7,475 00	10,795 00
Sumner.....	561	168	14,280	5,712 00	393	1,965 00	7,677 00
Thomas.....	3,782	302	15,100	6,040 00	3,480	17,400 00	23,440 00
Trego.....	2,928	1,464	73,200	29,280 00	1,464	7,320 00	36,600 00
Wabaunsee.....	776	116	11,600	4,640 00	660	5,280 00	9,920 00
Wallace.....	1,628	195	9,750	3,900 00	1,433	8,598 00	12,498 00
Washington.....	200	150	10,500	4,200 00	50	250 00	4,450 00
Wichita.....	2,124	424	16,960	6,784 00	1,700	8,500 00	15,284 00
Wilson.....	715	264	10,560	4,224 00	451	8,706 00	12,930 00
Woodson.....	376	338	27,040	10,816 00	38	190 00	11,006 00
Wyandotte.....	69	69	6,900	2,760 00	.....	.....	2,760 00
Totals.....	172,893	40,688	2,264,520	\$905,808 00	132,205	\$794,182 00	\$1,699,990 00

SORGHUM, 1894.

TABLE showing the number of acres, product, and value.

COUNTIES.	Acres planted.	Acres manufactured into syrup.	Gallons of syrup.	Value of syrup.	Acres of forage.	Value of forage.	Total value of crop.
Allen.....	422	337	30,330	\$12,132 00	85	\$425 00	\$12,557 00
Anderson.....	178	154	7,700	3,080 00	24	120 00	3,200 00
Atchison.....	93	88	4,400	1,760 00	5	25 00	1,785 00
Barber.....	6,417	5,133	513,300	205,320 00	1,284	6,420 00	211,740 00
Barton.....	2,404	1,202	30,050	12,020 00	1,202	6,010 00	18,030 00
Bourbon.....	2,690	2,421	242,100	96,840 00	269	1,345 00	98,185 00
Brown.....	66	57	2,280	912 00	9	45 00	957 00
Butler.....	4,818	2,698	107,920	43,168 00	2,120	10,600 00	53,768 00
Chase.....	1,927	539	24,255	9,702 00	1,388	6,940 00	16,642 00
Chautauqua.....	810	348	3,480	1,392 00	462	2,310 00	3,702 00
Cherokee.....	894	759	24,288	9,715 20	135	675 00	10,390 20
Cheyenne.....	2,415	241	9,640	3,856 00	2,174	10,870 00	14,726 00
Clark.....	1,454	145	10,150	4,060 00	1,309	6,545 00	10,605 00
Clay.....	2,762	1,104	11,040	4,416 00	1,658	8,290 00	12,706 00
Cloud.....	3,418	170	3,400	1,360 00	3,248	16,240 00	17,600 00
Coffey.....	951	351	20,007	8,002 80	600	3,000 00	11,002 80
Comanche.....	1,156	23	460	184 00	1,133	5,665 00	5,849 00
Cowley.....	2,023	202	8,080	3,232 00	1,821	9,105 00	12,337 00
Crawford.....	186	156	9,360	3,744 00	30	150 00	3,894 00
Decatur.....	1,255	188	3,760	1,504 00	1,067	5,335 00	6,839 00
Dickinson.....	4,857	681	6,310	2,524 00	4,176	20,880 00	23,404 00
Doniphan.....	81	81	12,150	4,860 00	.....	.....	4,860 00
Douglas.....	301	150	15,000	6,000 00	151	755 00	6,755 00
Edwards.....	4,577	228	9,120	3,648 00	4,349	21,745 00	25,393 00
Elk.....	2,849	1,424	61,232	24,492 80	1,425	7,125 00	31,617 80
Ellis.....	5,562	278	8,340	3,336 00	5,284	26,420 00	29,756 00
Ellsworth.....	2,823	141	4,230	1,692 00	2,682	13,410 00	15,102 00
Finney.....	7,035	211	5,275	2,110 00	6,824	34,120 00	36,230 00
Ford.....	2,742	219	15,768	6,307 20	2,523	12,615 00	18,922 20
Franklin.....	438	381	51,435	20,574 00	57	285 00	20,859 00
Geary.....	601	192	3,840	1,536 00	409	2,045 00	3,581 00

SORGHUM, 1894—CONCLUDED.

COUNTIES.	Acres planted.	Acres manu- factured into syrup.	Gallons of syrup.	Value of syrup.	Acres of forage.	Value of forage.	Total value of crop.
Gove.....	4,339	216	12,960	\$5,184 00	4,123	\$20,615 00	\$25,799 00
Graham.....	1,877	431	9,482	3,792 80	1,446	7,230 00	11,022 80
Grant.....	1,694	203	6,090	2,436 00	1,491	7,455 00	9,891 00
Gray.....	3,057	305	12,200	4,880 00	2,752	13,760 00	18,640 00
Greeley.....	1,850	185	7,400	2,960 00	1,665	8,325 00	11,285 00
Greenwood.....	4,388	877	87,700	35,080 00	3,511	17,555 00	52,635 00
Hamilton.....	2,844	28	1,400	560 00	2,816	14,080 00	14,640 00
Harper.....	366	292	23,360	9,344 00	74	370 00	9,714 00
Harvey.....	2,958	798	43,890	17,556 00	2,160	10,800 00	28,356 00
Haskell.....	2,303	575	23,000	9,200 00	1,728	8,640 00	17,840 00
Hodgeman.....	5,103	2,041	81,640	32,656 00	3,062	15,310 00	47,966 00
Jackson.....	119	85	3,995	1,598 00	34	170 00	1,768 00
Jefferson.....	826	619	49,520	19,808 00	207	1,035 00	20,843 00
Jewell.....	2,044	756	15,120	6,048 00	1,288	6,440 00	12,488 00
Johnson.....	114	101	8,080	3,232 00	13	65 00	3,297 00
Kearny.....	1,794	89	801	320 40	1,705	8,525 00	8,845 40
Kingman.....	524	262	10,489	4,192 00	262	1,310 00	5,502 00
Kiowa.....	1,845	.92	2,760	1,104 00	1,753	8,765 00	9,869 00
Labette.....	510	382	25,594	10,237 60	128	640 00	10,877 60
Lane.....	3,288	65	3,250	1,300 00	3,223	16,115 00	17,415 00
Leavenworth.....	1,446	1,229	122,900	49,160 00	217	1,085 00	50,245 00
Lincoln.....	3,854	501	13,527	5,410 80	3,353	16,765 00	22,175 80
Linn.....	557	445	44,509	17,800 00	112	560 00	18,360 00
Logan.....	4,473	447	15,645	6,258 00	4,026	20,130 00	26,388 00
Lyon.....	1,761	440	26,400	10,560 00	1,321	6,605 00	17,165 00
Marion.....	5,376	430	21,500	8,600 00	4,946	24,730 00	33,330 00
Marshall.....	687	316	28,440	11,376 00	371	1,855 00	13,231 00
McPherson.....	3,760	188	9,400	3,760 00	3,572	17,860 00	21,620 00
Meade.....	2,745	274	10,960	4,384 00	2,471	12,355 00	16,739 00
Miami.....	395	316	31,600	12,640 00	79	395 00	13,035 00
Mitchell.....	1,256	565	35,030	14,012 00	601	3,455 00	17,467 00
Montgomery.....	603	150	5,550	2,220 00	453	2,265 00	4,485 00
Morris.....	1,367	177	12,036	4,814 40	1,190	5,950 00	10,764 40
Morton.....	1,900	19	570	228 00	1,881	9,405 00	9,633 00
Nemaha.....	264	227	22,700	9,080 00	37	185 00	9,265 00
Neosho.....	505	439	8,780	3,512 00	66	330 00	3,842 00
Ness.....	5,971	1,194	35,820	14,328 00	4,777	23,885 00	38,213 00
Norton.....	1,542	616	30,800	12,320 00	926	4,630 00	16,950 00
Osage.....	1,836	826	82,600	33,040 00	1,010	5,050 00	38,090 00
Osborne.....	1,580	79	1,975	790 00	1,501	7,505 00	8,295 00
Ottawa.....	5,922	296	10,952	4,380 80	5,626	28,130 00	32,510 80
Pawnee.....	4,385	438	17,520	7,008 00	3,947	19,735 00	26,743 00
Phillips.....	682	156	8,268	3,307 20	526	2,630 00	5,937 20
Pottawatomie.....	271	135	9,450	3,780 00	136	680 00	4,460 00
Pratt.....	407	73	6,570	2,628 00	334	1,670 00	4,298 00
Rawlins.....	2,573	257	10,280	4,112 00	2,316	11,580 00	15,692 00
Reno.....	1,888	245	14,700	5,880 00	1,643	8,215 00	14,095 00
Republic.....	832	299	14,950	5,980 00	533	2,665 00	8,645 00
Rice.....	1,071	342	6,840	2,736 00	729	3,645 00	6,381 00
Riley.....	374	119	2,975	1,190 00	255	1,275 00	2,465 00
Rooks.....	1,924	96	8,160	3,264 00	1,828	9,140 00	12,404 00
Rush.....	5,194	311	7,775	3,110 00	4,883	24,415 00	27,525 00
Russell.....	5,237	104	7,800	3,120 00	5,133	25,665 00	28,785 00
Saline.....	3,423	855	59,850	23,940 00	2,568	12,840 00	36,780 00
Scott.....	3,590	359	14,360	5,744 00	3,231	16,155 00	21,899 00
Sedgwick.....	994	99	4,950	1,980 00	895	4,475 00	6,455 00
Seward.....	1,402	60	3,500	1,400 00	1,342	6,710 00	8,110 00
Shawnee.....	585	58	3,480	1,392 00	527	2,635 00	4,027 00
Sheridan.....	1,543	462	18,480	7,392 00	1,081	5,405 00	12,797 00
Sherman.....	4,790	2,395	155,675	62,270 00	2,395	11,975 00	74,245 00
Smith.....	459	68	2,380	952 00	391	1,955 00	2,907 00
Stafford.....	2,355	353	14,120	5,648 00	2,002	10,010 00	15,658 00
Stanton.....	2,283	114	6,840	2,736 00	2,169	10,845 00	13,581 00
Stevens.....	1,757	175	1,750	700 00	1,582	7,910 00	8,610 00
Sumner.....	379	181	9,050	3,620 00	198	990 00	4,610 00
Thomas.....	4,095	40	2,000	800 00	4,055	20,275 00	21,075 00
Trego.....	3,250	325	9,750	3,900 00	2,925	14,625 00	18,525 00
Wabaunsee.....	585	251	12,550	5,020 00	334	1,670 00	6,690 00
Wallace.....	2,267	113	8,475	3,390 00	2,154	10,770 00	14,160 00
Washington.....	753	225	7,425	2,970 00	528	2,640 00	5,610 00
Wichita.....	3,121	624	15,600	6,240 00	2,497	12,485 00	18,725 00
Wilson.....	817	514	22,102	8,840 80	303	1,515 00	10,355 80
Woodson.....	368	276	22,080	8,832 00	92	460 00	9,292 00
Wyandotte.....	22	22	2,200	880 00	.....	.....	880 00
Totals.....	221,524	48,022	2,771,012	\$1,108,404 80	173,502	\$867,510 00	\$1,975,914 80

CASTOR BEANS.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	62	496	\$570 40	37	444	\$444 00
Anderson.....	62	496	570 40	83	830	830 00
Atchison.....	1	3	3 45			
Barber.....						
Barton.....						
Bourbon.....	573	2,865	3,294 75	462	3,696	3,696 00
Brown.....				50	500	500 00
Butler.....	26	104	119 60	20	160	160 00
Chase.....						
Chautauqua.....	481	2,886	3,318 90	420	3,360	3,360 00
Cherokee.....	240	1,920	2,208 00	171	1,368	1,368 00
Cheyenne.....	10	50	57 60	5	25	25 00
Clark.....				20	100	100 00
Clay.....						
Cloud.....	30	120	138 00			
Coffey.....	31	248	285 24			
Comanche.....						
Cowley.....						
Crawford.....	325	1,950	2,242 50	331	2,648	2,648 00
Decatur.....				5	20	20 00
Dickinson.....				2	8	8 00
Doniphan.....						
Douglas.....	56	448	515 20	10	100	100 00
Edwards.....						
Elk.....	40	320	368 00	15	120	120 00
Ellis.....						
Ellsworth.....						
Finney.....				3	12	12 00
Ford.....	7	21	24 15	10	30	30 00
Franklin.....	294	2,352	2,704 80	200	2,400	2,400 00
Geary.....						
Gove.....				5	25	25 00
Graham.....	10	80	92 00			
Grant.....	30	90	103 50			
Gray.....						
Greeley.....	20	60	69 00			
Greenwood.....				6	60	60 00
Hamilton.....	1	3	3 45			
Harper.....						
Harvey.....						
Haskell.....	3	9	10 35			
Hodgeman.....						
Jackson.....	4	32	36 80			
Jefferson.....						
Jewell.....						
Johnson.....	15	120	138 00	15	180	180 00
Kearny.....	14	42	48 30	30	150	150 00
Kingman.....						
Kiowa.....						
Labette.....	747	5,229	6,013 35	804	8,040	8,040 00
Lane.....						
Leavenworth.....						
Lincoln.....						
Linn.....	82	656	754 40	137	1,096	1,096 00
Logan.....	15	45	51 75			
Lyon.....						
Marion.....						
Marshall.....				2	16	16 00
McPherson.....						
Meade.....						
Miami.....	52	260	299 00	17	136	136 00
Mitchell.....						
Montgomery.....	168	840	966 00	231	1,386	1,386 00
Morris.....						
Morton.....	42	84	96 60			
Nemaha.....						
Neosho.....	689	4,134	4,754 10	1,078	8,624	8,624 00
Ness.....				5	20	20 00
Norton.....	2	6	6 90	3	12	12 00
Osage.....	70	420	483 00	10	100	100 00
Osborne.....	17	85	97 75			
Ottawa.....						
Pawnee.....						
Phillips.....				10	40	40 00
Pottawatomie.....				5	40	40 00

CASTOR BEANS — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....						
Rawlins.....	5	15	\$17 25	15	60	\$60 00
Reno.....						
Republic.....	17	51	58 65			
Rice.....				19	114	114 00
Riley.....						
Rooks.....						
Rush.....						
Russell.....						
Saline.....	10	50	57 50			
Scott.....						
Sedgwick.....	19	57	65 55			
Seward.....						
Shawnee.....						
Sheridan.....						
Sherman.....						
Smith.....						
Stafford.....						
Stanton.....	78	156	179 40	2	8	8 00
Stevens.....						
Sumner.....						
Thomas.....						
Trego.....						
Wabaunsee.....				18	180	180 00
Wallace.....						
Washington.....	10	50	57 50			
Wichita.....						
Wilson.....	184	1,472	1,692 80	371	3,710	3,710 00
Woodson.....	70	420	483 00	52	520	520 00
Wyandotte.....						
Totals.....	4,612	28,745	\$33,056 75	4,679	40,338	\$40,338 00

COTTON.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Allen.....						
Anderson.....						
Atchison.....						
Barber.....						
Barton.....						
Bourbon.....						
Brown.....						
Butler.....						
Chase.....						
Chautauqua.....	43	17,200	\$1,240 00	4	800	\$48 00
Cherokee.....	64					
Cheyenne.....						
Clark.....						
Clay.....						
Cloud.....						
Coffey.....						
Comanche.....						
Cowley.....	4					
Crawford.....						
Decatur.....						
Dickinson.....						
Doniphan.....						
Douglas.....	21					
Edwards.....						
Elk.....						
Ellis.....						
Ellsworth.....						
Finney.....						
Ford.....						
Franklin.....						
Geary.....						

COTTON — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Gove.....						
Graham.....	10					
Grant.....						
Gray.....						
Greeley.....						
Greenwood.....						
Hamilton.....						
Harper.....				1	200	\$12 00
Harvey.....						
Haskell.....						
Hodgeman.....						
Jackson.....	3					
Jefferson.....						
Jewell.....						
Johnson.....						
Kearny.....						
Kingman.....						
Kiowa.....				1	200	12 00
Labette.....						
Lane.....						
Leavenworth.....						
Lincoln.....						
Linn.....						
Logan.....						
Lyon.....						
Marion.....						
Marshall.....						
McPherson.....						
Meade.....						
Miami.....						
Mitchell.....						
Montgomery.....	83	16,600	\$1,162 00	21	4,200	252 00
Morris.....						
Morton.....						
Nemaha.....						
Neosho.....						
Ness.....						
Norton.....				7		
Osage.....						
Osborne.....						
Ottawa.....						
Pawnee.....						
Phillips.....	100					
Pottawatomie.....						
Pratt.....						
Rawlins.....						
Reno.....						
Republic.....				50		
Rice.....						
Riley.....						
Rooks.....						
Rush.....						
Russell.....						
Saline.....						
Scott.....						
Sedgwick.....						
Seward.....				5	1,000	60 00
Shawnee.....						
Sheridan.....						
Sherman.....						
Smith.....						
Stafford.....						
Stanton.....						
Stevens.....						
Sumner.....						
Thomas.....						
Trego.....						
Wabaunsee.....						
Wallace.....						
Washington.....						
Wichita.....						
Wilson.....						
Woodson.....						
Wyandotte.....						
Totals.....	328	33,800	\$2,366 00	89	6,400	\$384 00

FLAX.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen	6,225	43,575	\$37,038 75	8,036	8,036	\$80,360 00
Anderson	7,376	59,008	50,156 80	8,270	82,700	82,700 00
Atchison	456	3,648	3,100 80	290	2,900	2,900 00
Barber				40		
Barton						
Bourbon	6,144	49,152	41,779 50	6,539	52,312	52,312 00
Brown	540	5,400	4,590 00	180	1,440	1,440 00
Butler	6,252	50,016	42,513 60	7,151	42,906	42,906 00
Chase	413	2,065	1,755 25	790	7,110	7,110 00
Chautauqua	2,012	12,072	10,261 20	4,131	24,786	24,786 00
Cherokee	2,593	12,965	11,020 25	2,961	23,688	23,688 00
Cheyenne	210	1,470	1,249 50	159		
Clark	1			4		
Clay	130	650	552 50	50	250	250 00
Cloud	22	110	93 50	8		
Coffey	4,909	39,272	33,381 20	6,579	52,632	52,632 00
Comanche						
Cowley	378	1,890	1,606 50	341	2,046	2,046 00
Crawford	3,034	24,272	20,631 20	3,928	35,352	35,352 00
Decatur	36	108	91 80	7		
Dickinson	162	648	550 80	26		
Doniphan	52	416	353 60	35	280	280 00
Douglas	817	5,719	4,861 15	911	9,110	9,110 00
Edwards						
Elk	8,729	61,103	51,937 55	10,529	84,232	84,232 00
Ellis	5	10	8 50			
Ellsworth						
Finney	32	96	81 60	75		
Ford	27	108	91 80	1	2	2 00
Franklin	3,536	21,216	18,033 60	2,911	26,199	26,199 00
Geary	1	9	7 65	40	120	120 00
Gove						
Graham	20	60	51 00	1		
Grant						
Gray	52	104	88 40	7		
Greeley				7		
Greenwood	3,016	15,075	12,813 75	3,062	24,496	24,496 00
Hamilton	7	14	11 90	12		
Harper	8	32	27 20			
Harvey	160	800	680 00	34	306	306 00
Haskell	80	160	136 00			
Hodgeman	26	78	66 30			
Jackson	607	4,249	3,611 65	923	8,307	8,307 00
Jefferson	968	7,744	6,582 40	698	5,584	5,583 00
Jewell	20	100	85 00	60	240	240 00
Johnson	1,060	8,480	7,208 00	1,384	15,224	15,224 00
Kearny						
Kingman						
Kiowa						
Labette	2,088	18,792	15,973 20	3,158	22,106	22,106 00
Lane						
Leavenworth	112	1,003	856 80	177	1,593	1,593 00
Lincoln	30	120	102 00	25	75	75 00
Linn	4,318	30,226	25,692 10	5,203	52,030	52,030 00
Logan	10	30	25 50	1		
Lyon	798	7,182	6,104 70	712	7,832	7,832 00
Marion	1,829	12,803	10,882 55	1,025	8,200	8,200 00
Marshall	189	1,322	1,124 55	62	744	744 00
McPherson	162	810	688 50	166	1,162	1,162 00
Meade						
Miami	4,176	37,584	31,946 40	4,110	36,990	36,990 00
Mitchell						
Montgomery	5,292	31,752	26,989 20	10,139	70,973	70,973 00
Morris	804	5,628	4,783 80	1,248	9,984	9,984 00
Morton						
Nemaha	1,597	15,970	13,574 50	2,026	18,234	18,234 00
Neosho	6,144	49,152	41,779 20	9,049	81,441	81,441 00
Ness	24	96	81 60	29	58	58 00
Norton				85	170	170 00
Osage	914	7,312	6,215 20	1,396	12,564	12,564 00
Osborne	25	100	85 00	4	8	8 00
Ottawa	40	120	102 00	8	16	16 00
Pawnee	138	552	469 20	5	10	10 00
Phillips	54	162	137 70	16	48	48 00
Pottawatomie	31	186	158 10	70	420	420 00

FLAX—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Pratt.....	14	70	\$59 50	1		
Rawlins.....	167	1,336	1,135 60	62	248	\$248 00
Reno.....	70	350	297 50	6	18	18 00
Republic.....	66	264	224 40	26	78	78 00
Rice.....	40	160	136 00			
Riley.....	40	200	170 00	15	45	45 00
Rooks.....	3	12	10 20			
Rush.....	1	4	3 40	1		
Russell.....						
Saline.....				5	15	15 00
Scott.....	74	222	188 70			
Sedgwick.....				1	6	6 00
Seward.....	2	8	6 80			
Shawnee.....	32	256	217 60	3	27	27 00
Sheridan.....				43	86	86 00
Sherman.....	17	68	57 80	33	66	66 00
Smith.....	113	565	480 25	65	195	195 00
Stafford.....	12	48	40 80	2	8	8 00
Stanton.....						
Stevens.....				6	12	12 00
Sumner.....	21	84	71 40			
Thomas.....	90	450	382 50	57	171	171 00
Trego.....						
Wabaunsee.....	277	2,216	1,883 60	150	1,200	1,200 00
Wallace.....	34	102	86 70			
Washington.....	1,712	13,696	11,641 60	671	7,381	7,381 00
Wichita.....				40	120	120 00
Wilson.....	7,362	51,534	43,803 90	13,026	91,182	91,182 00
Woodson.....	6,327	37,962	32,267 70	4,415	35,320	35,320 00
Wyandotte.....						
Totals.....	105,364	762,409	\$648,047 65	127,542	1,043,418	\$1,043,418 00

TOBACCO.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Allen.....	10					
Anderson.....	10					
Atchison.....	35			20	12,000	\$1,200 00
Barber.....				10	6,000	600 00
Barton.....						
Bourbon.....	5			3	1,800	180 00
Brown.....				5	3,000	300 00
Butler.....				1	600	60 00
Chase.....						
Chautauqua.....	73			1	600	60 00
Cherokee.....	1			2	1,200	120 00
Cheyenne.....				1		
Clark.....						
Clay.....						
Cloud.....						
Coffey.....						
Comanche.....						
Cowley.....				7	4,200	420 00
Crawford.....						
Decatur.....				10		
Dickinson.....						
Doniphan.....						
Douglas.....	1					
Edwards.....						
Elk.....				1	600	60 00
Ellis.....	4			35	17,500	1,750 00
Ellsworth.....						
Finney.....						
Ford.....						
Franklin.....	40	24,000	\$2,400 00	47	61,100	6,110 00
Geary.....	1			1	300	30 00

TOBACCO — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Gove.....						
Graham.....	7			1		
Grant.....						
Gray.....						
Greeley.....						
Greenwood.....						
Hamilton.....						
Harper.....	1					
Harvey.....						
Haskell.....						
Hodgeman.....						
Jackson.....						
Jefferson.....						
Jewell.....						
Johnson.....				6	3,600	\$360 00
Kearny.....						
Kingman.....						
Kiowa.....						
Labette.....	2			14	8,400	840 00
Lane.....						
Leavenworth.....						
Lincoln.....						
Linn.....	1			2	1,200	120 00
Logan.....				1	300	30 00
Lyon.....						
Marion.....						
Marshall.....	1					
McPherson.....						
Meade.....						
Miami.....	44			37	48,100	4,810 00
Mitchell.....						
Montgomery.....	1					
Morris.....						
Morton.....						
Nemaha.....				2	600	60 00
Neosho.....	1			1	1,200	120 00
Ness.....						
Norton.....				1	300	30 00
Osage.....						
Osborne.....						
Ottawa.....						
Pawnee.....						
Phillips.....						
Pottawatomie.....						
Pratt.....						
Rawlins.....				3		
Reno.....						
Republic.....	4			9	2,700	270 00
Rice.....						
Riley.....						
Rooks.....				1		
Rush.....	12			3		
Russell.....						
Saline.....	1					
Scott.....				3		
Sedgwick.....						
Seward.....						
Shawnee.....						
Sheridan.....						
Sherman.....				11		
Smith.....				1		
Stafford.....	110					
Stanton.....						
Stevens.....						
Sumner.....						
Thomas.....						
Trego.....						
Wabaunsee.....	1			1	600	60 00
Wallace.....						
Washington.....						
Wichita.....	1					
Wilson.....						
Woodson.....	3			2	2,400	240 00
Wyandotte.....						
Totals.....	370	24,000	\$2,400 00	243	178,300	\$17,830 00

BROOM CORN.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Allen	3,017	1,508,500	\$37,712 50	2,050	1,025,000	\$41,000 00
Anderson	33	16,500	412 50	5		
Atchison				55	22,000	1,100 00
Barber	180	90,000	2,250 00	85		
Barton	50	25,000	750 00	16		
Bourbon	165	66,000	1,650 00	156		
Brown	25	12,500	375 00	10		
Butler	179	71,600	2,148 00	207		
Chase	12	6,000	180 00	33		
Chautauqua	26	13,000	390 00	38		
Cherokee	80	32,000	960 00	44		
Cheyenne	15,593	6,237,200	124,744 00	12,016		
Clark	225	90,000	1,800 00	166	11,620	290 50
Clay	75	45,000	1,350 00	1		
Cloud	185	64,750	1,942 50	76		
Coffey	30	15,000	450 00	48	7,200	252 00
Comanche	395	197,500	4,937 50	285	85,000	2,992 50
Cowley	527	263,500	7,905 00	473	283,800	9,933 00
Crawford	51	40,800	1,224 00	49	12,250	428 75
Decatur	600	300,000	9,000 00	470	188,000	8,640 00
Dickinson	111	55,500	1,387 50	103		
Doniphan	23	11,500	345 00	16		
Douglas	72	43,200	1,296 00	22		
Edwards	980	367,500	7,350 00	1,032	206,400	4,128 00
Elk	147	73,500	2,205 00	105	26,250	787 50
Ellis				10		
Ellsworth	70	42,000	1,260 00	20	10,000	250 00
Finney	1,071	535,500	13,387 50	591	265,950	7,978 50
Ford	61	30,500	762 50	167	10,020	250 50
Franklin				6		
Geary				8	800	20 00
Gove	1,586	634,400	15,860 00	1,156	346,800	8,670 00
Graham	1,031	412,400	10,310 00	1,295	84,175	2,104 38
Grant	4,696	1,174,000	29,350 00	2,083	520,750	15,622 50
Gray	210	63,000	2,175 00	62		
Greeley	3,460	865,000	21,625 00	3,331		
Greenwood	35	17,500	525 00			
Hamilton	2,868	1,434,000	35,850 00	1,291	64,556	1,936 50
Harper	20	8,000	240 00	135		
Harvey	20	8,000	240 00	45	18,000	540 00
Haskell	969	339,150	8,478 75	418	146,300	2,926 00
Hodgeman	5	2,000	50 00	4		
Jackson	6	3,996	119 88	33	16,500	495 00
Jefferson	93	46,500	1,395 00	28		
Jewell	158	79,000	1,975 00	48		
Johnson	12	6,000	180 00	10	6,000	120 00
Kearny	2,199	1,319,400	32,985 00	206	41,200	1,236 00
Kingman	15	7,500	187 50	45	9,000	270 00
Kiowa	200	100,000	2,500 00	341		
Labette	50	20,000	600 00	97	29,100	1,018 50
Lane	250	125,000	3,125 00	612	183,600	5,508 00
Leavenworth	20	12,000	240 00	1	300	10 50
Lincoln	48	24,000	720 00	12		
Linn	22	11,000	275 00	20	8,000	280 00
Logan	834	250,200	6,255 00	763		
Lyon	12	6,000	180 00	66	39,600	1,584 00
Marion	2,042	1,123,100	33,693 00	1,123	561,500	19,652 50
Marshall	395	197,500	5,925 00	220	88,000	3,520 00
McPherson	7,122	4,743,252	118,581 30	5,271	3,162,600	126,504 00
Meade	829	207,250	5,181 25	150	45,000	1,350 00
Miami				18		
Mitchell	44	22,000	660 00	30		
Montgomery	347	242,900	7,287 00	276	138,000	4,485 00
Morris	210	99,750	2,992 50	90	18,000	540 00
Morton	3,419	940,225	18,804 50	3,692	738,400	18,460 00
Nemaha	145	72,500	2,175 00	18	10,800	378 00
Neosho	1,164	523,800	10,476 00	604	362,400	9,060 00
Ness	1,665	832,500	20,812 00	1,704	85,200	1,704 00
Norton	570	285,000	7,125 00	475		
Osage	110	55,000	1,650 00	87		
Osborne	1,557	700,650	21,019 50	1,027	308,100	6,162 00
Ottawa	6	3,600	108 50	14		
Pawnee	1,514	605,600	12,112 00	1,042	156,300	3,907 50
Phillips	2,255	1,127,500	22,550 00	1,555	622,000	12,440 00
Pottawatomie	43	21,500	645 00	32	8,000	320 00

BROOM CORN—CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Pounds.	Value.	Acres.	Pounds.	Value.
Pratt.....	685	342,500	\$8,562 50	587	293,500	\$10,272 50
Rawlins.....	3,697	1,293,950	25,879 00	1,892	378,400	9,460 00
Reno.....	4,025	1,811,250	54,337 50	3,564	1,425,600	35,640 00
Republic.....	907	453,500	13,605 00	888	177,600	4,440 00
Rice.....	5,833	1,749,900	52,497 00	4,382	1,314,600	46,011 00
Riley.....	238	119,000	3,570 00	210	105,000	3,150 00
Rooks.....	85	42,500	1,700 00	20	.....	.....
Rush.....	718	394,900	7,898 00	798	139,650	4,887 75
Russell.....	350	175,000	5,250 00	571	285,500	9,992 50
Saline.....	85	42,500	1,062 50	363	.....	.....
Scott.....	120	48,000	1,200 00	65	.....	.....
Sedgwick.....	49	24,500	735 00	44	.....	.....
Seward.....	4,555	911,000	18,220 00	1,947	146,025	3,650 63
Shawnee.....	124	62,000	1,860 00	58	.....	.....
Sheridan.....	4,681	1,404,300	35,107 50	4,088	.....	.....
Sherman.....	8,567	2,570,100	51,402 00	3,143	.....	.....
Smith.....	741	444,600	13,338 00	421	42,100	1,052 50
Stafford.....	1,685	842,500	25,275 00	1,888	377,600	13,216 00
Stanton.....	6,818	1,363,600	27,272 00	2,598	259,800	8,443 50
Stevens.....	7,702	1,540,400	46,212 00	4,607	322,490	9,674 70
Sumner.....	.....	.....	.....	2	.....	.....
Thomas.....	4,136	2,721,600	81,648 00	2,953	147,650	4,429 50
Trego.....	324	162,000	4,860 00	215	26,875	806 25
Wabaunsee.....	12	4,800	96 00	8	.....	.....
Wallace.....	3,454	1,036,200	31,086 00	2,331	.....	.....
Washington.....	232	116,000	3,480 00	58	11,600	464 00
Wichita.....	232	116,000	2,900 00	204	61,200	1,530 00
Wilson.....	1,788	894,000	17,880 00	800	480,000	14,400 00
Woodson.....	213	106,500	3,195 00	120	.....	.....
Wyandotte.....	.....	.....	.....	.....	.....	.....
Totals.....	128,695	49,818,823	\$1,235,541 18	86,718	15,967,655	\$510,376 46

MILLET AND HUNGARIAN.

TABLE showing the number of acres, product and value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Acres.	Tons.	Value.	Acres.	Tons.	Value.
Allen.....	6,930	12,127	\$36,381 00	5,742	8,613	\$34,452 00
Anderson.....	3,593	5,389	26,945 00	2,842	5,684	22,736 00
Atchison.....	1,414	2,828	14,140 00	1,515	2,652	13,260 00
Barber.....	3,010	3,010	9,030 00	1,878	2,817	8,451 00
Barton.....	2,111	3,694	18,470 00	2,971	4,457	22,285 00
Bourbon.....	3,032	5,306	26,530 00	2,523	3,784	15,136 00
Brown.....	1,448	3,620	14,480 00	1,448	1,448	7,240 00
Butler.....	8,754	17,508	87,540 00	12,365	21,638	64,914 00
Chase.....	3,721	4,651	18,604 00	4,764	9,528	38,112 00
Chautauqua.....	3,224	5,642	16,926 00	3,264	5,712	17,136 00
Cheerokee.....	943	1,414	5,656 00	489	734	2,936 00
Cheyenne.....	2,520	1,890	9,450 00	3,304	3,304	16,520 00
Clark.....	885	1,327	6,635 00	493	369	1,476 00
Clay.....	3,529	8,822	44,110 00	5,168	7,752	38,760 00
Cloud.....	2,812	5,624	28,120 00	4,842	4,842	24,210 00
Coffey.....	4,212	8,424	25,272 00	4,380	6,570	26,280 00
Comanche.....	956	956	2,868 00	211	156	312 00
Cowley.....	4,402	5,502	22,008 00	4,408	4,408	22,040 00
Crawford.....	1,168	2,920	14,600 00	1,131	1,696	5,088 00
Decatur.....	3,109	6,218	18,654 00	3,788	2,841	14,205 00
Dickinson.....	6,764	16,910	84,550 00	3,406	4,257	21,285 00
Doniphan.....	406	913	4,565 00	462	577	2,885 00
Douglas.....	1,286	2,250	11,250 00	1,329	2,658	10,632 00
Edwards.....	2,169	2,169	6,507 00	2,127	3,721	11,163 00
Elk.....	4,775	7,162	21,486 00	3,722	5,583	22,332 00
Ellis.....	2,099	2,623	13,115 00	3,306	4,959	29,754 00
Ellsworth.....	1,103	2,206	11,030 00	738	1,107	6,642 00
Finney.....	727	727	2,908 00	1,299	1,948	5,844 00
Ford.....	1,212	1,818	9,090 00	1,472	1,472	7,360 00
Franklin.....	2,964	5,187	15,561 00	2,297	3,445	13,780 00
Geary.....	947	1,894	9,470 00	1,464	1,464	7,320 00

MILLET AND HUNGARIAN — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Tons.	Value.	Acres.	Tons.	Value.
Gove.....	699	1,048	\$4,192 00	1,939	1,939	\$9,695 00
Graham.....	1,865	2,480	12,400 00	3,278	2,457	12,285 00
Grant.....	221	110	330 00	94	69	345 00
Gray.....	484	242	726 00	344	258	1,290 00
Greeley.....	424	212	1,060 00	507	378	1,890 00
Greenwood.....	5,576	11,172	33,516 00	6,588	9,882	39,528 00
Hamilton.....	122	61	183 00	183	138	690 00
Harper.....	2,491	2,491	9,964 00	1,098	1,098	5,490 00
Harvey.....	955	1,671	8,355 00	2,011	3,017	15,085 00
Haskell.....	728	728	3,640 00	224	112	560 00
Hodgeman.....	2,070	517	2,068 00	2,409	2,409	12,045 00
Jackson.....	3,401	7,652	30,608 00	5,133	8,983	44,915 00
Jefferson.....	2,576	5,152	20,608 00	3,928	7,856	39,280 00
Jewell.....	7,049	10,573	42,292 00	12,664	12,664	50,656 00
Johnson.....	732	1,281	5,124 00	385	770	3,080 00
Kearny.....	58	29	116 00	37	28	140 00
Kingman.....	847	1,058	5,290 00	850	850	4,250 00
Kiowa.....	800	800	4,000 00	316	316	1,264 00
Labette.....	1,052	1,578	7,890 00	1,043	1,043	5,215 00
Lane.....	168	356	1,680 00	373	187	935 00
Leavenworth.....	979	1,713	6,852 00	1,393	1,741	8,705 00
Lincoln.....	764	1,146	4,584 00	281	281	1,405 00
Linn.....	1,945	3,403	13,612 00	1,701	2,551	10,204 00
Logan.....	860	1,720	5,160 00	1,757	879	4,395 00
Lyon.....	7,809	15,618	62,472 00	10,224	20,448	102,240 00
Marion.....	3,305	5,783	23,132 00	5,477	10,954	43,816 00
Marshall.....	11,815	26,583	106,332 00	15,338	23,007	69,021 00
McPherson.....	1,761	3,523	17,610 00	2,414	3,621	18,105 00
Meade.....	816	816	3,264 00	444	222	1,110 00
Miami.....	1,965	3,930	15,720 00	2,153	4,306	21,530 00
Mitchell.....	1,902	2,853	11,412 00	2,376	2,970	11,880 00
Montgomery.....	2,230	5,017	20,068 00	1,905	3,343	13,332 00
Morris.....	6,535	13,070	39,210 00	10,867	19,015	76,060 00
Morton.....	40	40	200 00	81	42	210 00
Nemaha.....	5,455	16,365	49,095 00	6,733	8,416	33,664 00
Neosho.....	2,335	4,086	16,344 00	2,028	2,535	12,675 00
Ness.....	1,366	2,732	13,660 00	3,624	3,624	18,120 00
Norton.....	2,581	1,935	9,675 00	5,867	5,867	29,335 00
Osage.....	6,302	12,604	50,416 00	6,329	9,493	37,972 00
Osborne.....	1,837	3,214	9,642 00	3,028	2,271	6,813 00
Ottawa.....	1,192	2,086	6,258 00	841	841	4,205 00
Pawnee.....	3,579	1,789	7,156 00	4,418	4,418	22,090 00
Phillips.....	2,844	4,266	21,330 00	3,616	4,520	22,600 00
Pottawatomie.....	5,684	14,210	71,050 00	5,754	7,192	35,960 00
Pratt.....	452	452	1,808 00	249	124	620 00
Rawlins.....	2,644	3,966	19,830 00	4,564	3,423	17,115 00
Reno.....	2,849	2,136	8,544 00	2,625	5,250	21,000 00
Republic.....	6,270	10,972	54,860 00	8,202	8,202	49,212 00
Rice.....	2,885	2,885	14,425 00	2,630	2,630	13,150 00
Riley.....	2,837	5,674	22,696 00	3,760	7,520	45,120 00
Rooks.....	3,131	6,262	31,310 00	4,582	2,291	11,455 00
Rush.....	2,545	1,908	5,724 00	6,391	6,391	31,955 00
Russell.....	1,070	1,337	5,348 00	1,166	874	4,370 00
Saline.....	672	672	2,688 00	709	1,063	5,315 00
Scott.....	205	102	306 00	572	1,144	5,720 00
Sedgwick.....	2,162	2,162	8,648 00	2,971	1,486	7,430 00
Seward.....	364	182	546 00	142	71	355 00
Shawnee.....	3,563	8,907	35,628 00	3,882	6,792	27,168 00
Sheridan.....	1,980	1,485	7,425 00	2,463	1,232	6,160 00
Sherman.....	3,035	3,035	15,175 00	4,833	2,417	12,085 00
Smith.....	5,739	7,173	35,865 00	8,511	6,384	31,920 00
Stafford.....	2,995	3,743	11,229 00	2,175	1,632	6,528 00
Stanton.....	45	22	66 00	42	21	105 00
Stevens.....	339	84	420 00	368	184	920 00
Sumner.....	1,948	1,948	9,740 00	1,030	1,030	5,150 00
Thomas.....	2,413	1,809	10,854 00	2,613	653	3,265 00
Trego.....	1,917	2,875	11,500 00	2,419	1,209	6,045 00
Wabaunsee.....	5,836	11,672	46,688 00	5,997	8,995	35,980 00
Wallace.....	935	935	1,870 00	1,813	1,813	9,065 00
Washington.....	6,671	15,009	90,054 00	11,309	11,309	45,236 00
Wichita.....	180	90	270 00	74	37	185 00
Wilson.....	3,828	6,699	26,796 00	3,068	4,602	23,010 00
Woodson.....	2,983	4,474	17,896 00	2,701	5,402	21,608 00
Wyandotte.....	59	147	882 00	91	228	1,140 00
Totals.....	267,006	457,240	\$1,913,338 00	323,153	421,606	\$1,837,018 00

MILO MAIZE AND KAFFIR CORN.

Product estimated in tons for 1893; in bushels for 1894.

TABLE showing the number of acres, product and value for the year 1893.

COUNTIES.	MILO MAIZE, 1893.			KAFFIR CORN, 1893.		
	Acres.	Tons.	Value.	Acres.	Tons.	Value.
Allen.....	1	4	\$14 00	905	3,620	\$12,670 00
Anderson.....	36	144	504 00	224	896	3,136 00
Atchison.....				4	16	56 00
Barber.....	233	699	2,446 00	765	3,060	10,710 00
Barton.....	95	380	1,330 00	243	729	2,551 00
Bourbon.....	45	180	630 00	6	24	84 00
Brown.....						
Butler.....	60	240	840 00	792	2,376	8,316 00
Chase.....	2	6	21 00	291	1,164	4,074 00
Chautauqua.....	28	84	294 00	238	714	2,499 00
Cherokee.....				10	30	105 00
Cheyenne.....	5	20	70 00	7	21	73 00
Clark.....	192	576	2,016 00	2,480	7,440	26,040 00
Clay.....	15	60	210 00	762	2,286	8,001 00
Cloud.....				86	344	1,204 00
Coffey.....				116	348	1,218 00
Comanche.....	240	720	2,520 00	2,405	4,810	16,835 00
Cowley.....	192	768	2,688 00	480	960	3,360 00
Crawford.....	20	80	280 00	22	88	308 00
Decatur.....				45	90	315 00
Dickinson.....	12	48	168 00	1,549	6,196	21,686 00
Doniphan.....						
Douglas.....	13	52	182 00	19	76	266 00
Edwards.....	47	75	259 00	465	930	3,255 00
Elk.....	146	584	2,044 00	628	1,884	6,594 00
Ellis.....	20	60	210 00	1,044	2,088	7,308 00
Ellsworth.....	244	976	3,416 00	225	675	2,363 00
Finney.....	248	744	2,604 00	822	1,644	5,754 00
Ford.....	16	48	168 00	1,171	1,757	6,149 00
Franklin.....						
Geary.....		12	42 00	142	568	1,988 00
Gove.....	80	160	560 00	498	1,494	5,229 00
Graham.....	26	78	273 00	248	744	2,604 00
Grant.....	465	1,395	4,882 00	1,150	2,300	8,050 00
Gray.....	74	148	518 00	1,263	2,526	8,839 00
Greeley.....	229	687	2,404 00	138	276	966 00
Greenwood.....	30	120	420 00	1,627	6,508	22,778 00
Hamilton.....	645	1,935	6,763 00	497	994	3,479 00
Harper.....	43	129	451 00	426	1,278	4,473 00
Harvey.....				219	438	1,533 00
Haskell.....	247	494	1,729 00	2,005	4,010	14,035 00
Hodgeman.....	114	342	1,197 00	780	1,560	5,460 00
Jackson.....				10	40	140 00
Jefferson.....	2	8	28 00			
Jewell.....						
Johnson.....						
Kearny.....	100	250	875 00	951	1,902	6,657 00
Kingman.....	90	270	945 00	237	711	2,489 00
Kiowa.....	27	81	283 00	491	1,473	5,156 00
Labette.....	8	32	112 00	41	164	574 00
Lane.....	49	122	427 00	441	822	3,087 00
Leavenworth.....				13	52	182 00
Lincoln.....	106	318	1,113 00	1,099	3,297	11,539 00
Linn.....	36	144	504 00	5	20	70 00
Logan.....	128	128	448 00	282	423	1,481 00
Lyon.....	47	188	658 00	210	840	2,940 00
Marion.....	40	160	560 00	39	156	546 00
Marshall.....				1	3	11 00
McPherson.....	14	42	147 00	44	176	616 00
Meade.....	465	1,395	4,882 00	1,210	2,420	8,470 00
Miami.....						
Mitchell.....	10	30	105 00	180	540	1,890 00
Montgomery.....	23	92	322 00	36	180	630 00
Morris.....	8	32	112 00	1,218	3,654	12,789 00
Morton.....	920	2,300	8,050 00	422	844	2,954 00
Nemaha.....	2	8	28 00	5	15	53 00
Neosho.....	5,002	10,004	35,014 00	2,832	11,328	39,648 00
Ness.....	96	288	1,008 00	1,716	5,148	18,018 00
Norton.....	4	12	42 00	53	159	556 00
Osage.....	33	132	462 00	302	1,359	4,756 00
Osborne.....	22	88	308 00	321	1,284	4,494 00
Ottawa.....	19	57	199 00	453	1,812	6,342 00
Pawnee.....	157	235	823 00	309	618	2,163 00
Phillips.....	32	96	336 00	87	261	913 00

MILO MAIZE AND KAFFIR CORN—CONTINUED.

COUNTIES.	MILO MAIZE, 1893.			KAFFIR CORN, 1893.		
	Acres.	Tons.	Value.	Acres.	Tons.	Value.
Pottawatomie.....	4	16	\$56 00	4	16	\$56 00
Pratt.....	5	15	53 00	303	909	3,181 00
Rawlins.....				3	6	21 00
Reno.....				61	183	640 00
Republic.....	4	12	42 00	62	186	558 00
Rice.....				58	174	609 00
Riley.....	1	3	11 00	31	93	326 00
Rooks.....	6	18	63 00	209	836	2,926 00
Rush.....	26	104	364 00	103	412	1,442 00
Russell.....	100	400	1,400 00	778	3,112	10,892 00
Saline.....	18	72	252 00	132	528	1,848 00
Scott.....	128	320	1,120 00	117	234	819 00
Sedgwick.....	21	63	221 00	94	282	987 00
Seward.....	472	1,416	4,956 00	489	978	3,423 00
Shawnee.....	14	56	196 00	28	112	392 00
Sheridan.....	5	15	53 00	135	270	945 00
Sherman.....				5	10	35 00
Smith.....				23	69	242 00
Stafford.....	84	252	882 00	410	1,230	4,305 00
Stanton.....	1,176	2,352	8,232 00	1,321	1,981	6,953 00
Stevens.....	440	440	1,540 00	1,387	2,081	7,283 00
Sumner.....	47	141	493 00	75	225	788 00
Thomas.....	14	42	147 00	174	261	913 00
Trego.....	36	72	252 00	575	863	3,021 00
Wabunsee.....	5	20	70 00	209	836	2,926 00
Wallace.....	34	68	238 00	956	1,912	6,692 00
Washington.....	3	9	32 00	53	159	556 00
Wichita.....	8	16	56 00	534	1,068	3,738 00
Wilson.....	37	148	518 00	123	492	1,722 00
Woodson.....	10	40	140 00	654	2,616	9,156 00
Wyandotte.....						
Totals.....	14,004	34,670	\$121,331 00	46,911	128,857	\$450,903 00

MILO MAIZE AND KAFFIR CORN—CONTINUED.

TABLE showing the number of acres, product and value for the year 1894.

COUNTIES.	MILO MAIZE, 1894.			KAFFIR CORN, 1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Allen.....	14	280	\$126 00	1,874	37,483	\$18,740 00
Anderson.....	23	460	207 00	267	5,340	2,670 00
Atchison.....				2	40	20 00
Barber.....	347	8,675	3,903 75	2,363	54,349	27,174 50
Barton.....	144	2,880	1,296 00	1,671	33,420	16,710 00
Bourbon.....				10	200	100 00
Brown.....				19	475	237 50
Butler.....	74	1,110	499 50	1,640	22,960	11,480 00
Chase.....	38	760	342 00	653	13,060	6,530 00
Chautauqua.....	62	1,240	558 00	383	9,575	4,787 50
Cherokee.....	3	60	27 00	61	1,220	610 00
Cheyenne.....	38	380	171 00	10	100	50 00
Clark.....	133	665	299 25	2,125	10,625	5,312 50
Clay.....	29	290	130 50	3,463	17,315	8,657 50
Cloud.....	36	360	162 00	630	3,150	1,575 00
Coffey.....	21	315	141 75	106	3,180	1,590 00
Comanche.....	43	1,290	580 50	3,022	48,352	24,176 00
Cowley.....	134	2,680	1,206 00	696	17,400	8,700 00
Crawford.....				68	2,040	1,020 00
Decatur.....				94	940	470 00
Dickinson.....	198	1,980	891 00	4,845	48,450	24,225 00
Doniphan.....	9	180	81 00			
Douglas.....	6	150	67 50	64	1,280	640 00
Edwards.....	85	850	382 50	1,761	17,610	8,805 00
Elk.....	188	3,760	1,692 00	1,499	14,990	7,495 00
Ellis.....	21	105	47 25	2,605	26,050	13,025 00
Ellsworth.....	283	2,830	1,273 50	451	4,510	2,255 00
Finney.....	189	3,402	1,530 90	2,794	55,880	27,940 00
Ford.....	17	153	68 85	1,499	14,990	7,495 00
Franklin.....	1	25	11 25	2	40	20 00
Geary.....	12	120	54 00	293	2,930	1,465 00

MILO MAIZE AND KAFFIR CORN—CONCLUDED.

COUNTIES.	MILO MAIZE, 1894.			KAFFIR CORN, 1894.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Gove.....	21	210	\$94 50	303	3,030	\$1,515 00
Graham.....	53	1,060	477 00	666	13,320	6,660 00
Grant.....	442	5,304	2,386 80	1,307	13,070	6,535 00
Gray.....	29	290	130 50	1,341	13,410	6,705 00
Greeley.....	276	2,760	1,242 00	256	2,560	1,280 00
Greenwood.....	90	1,800	810 00	4,801	144,030	72,015 00
Hamilton.....	293	2,344	1,054 80	855	8,550	4,275 00
Harper.....	167	1,670	751 50	1,305	13,050	6,525 00
Harvey.....	2	30	13 50	258	5,160	2,580 00
Haskell.....	81	1,620	729 00	1,745	52,350	26,175 00
Hodgeman.....	43	860	387 00	1,670	33,400	16,700 00
Jackson.....	3	90	40 50	1	30	15 00
Jefferson.....	5	150	67 50	29	870	435 00
Jewell.....	5	100	45 00	11	220	110 00
Johnson.....	2	80	36 00	4	120	60 00
Kearny.....	57	570	256 50	1,946	19,460	9,730 00
Kingman.....	188	1,880	846 00	1,273	12,730	6,365 00
Kiowa.....	48	480	216 00	1,220	6,100	3,050 00
Labette.....	3	75	33 75	242	4,840	2,420 00
Lane.....	7	70	31 50	310	3,100	1,550 00
Leavenworth.....	5	100	45 00	4	100	50 00
Lincoln.....	210	3,150	1,417 50	4,010	40,100	20,050 00
Linn.....	36	720	324 00	12	300	150 00
Logan.....	231	2,310	1,039 50	419	8,380	4,190 00
Lyon.....	20	400	180 00	537	10,740	5,370 00
Marion.....	7	140	63 00	274	5,480	2,740 00
Marshall.....	.....	.....	.....	44	880	440 00
McPherson.....	42	840	378 00	519	7,785	3,892 50
Meade.....	215	2,150	967 50	2,507	25,070	12,535 00
Miami.....	13	260	117 00	3	75	37 50
Mitchell.....	10	100	45 00	1,139	11,390	5,695 00
Montgomery.....	41	820	369 00	64	1,280	640 00
Morris.....	120	2,400	1,080 00	1,256	10,048	5,024 00
Morton.....	620	3,100	1,395 00	521	2,605	1,302 50
Nemaha.....	5	100	45 00	12	120	60 00
Neosho.....	16	400	180 00	711	17,775	8,887 50
Ness.....	36	720	324 00	2,261	22,610	11,305 00
Norton.....	1	10	4 50	69	345	172 50
Osage.....	13	325	146 25	400	4,000	2,000 00
Osborne.....	17	170	76 50	769	7,690	3,845 00
Ottawa.....	24	120	54 00	3,139	15,695	7,847 50
Pawnee.....	175	1,750	787 50	1,650	16,500	8,250 00
Phillips.....	12	120	54 00	116	2,320	1,160 00
Pottawatomie.....	6	150	67 50	123	2,460	1,230 00
Pratt.....	60	1,800	810 00	1,499	22,485	11,242 50
Rawlins.....	4	60	27 00	14	140	70 00
Reno.....	77	1,540	693 00	1,003	20,060	10,030 00
Republic.....	.....	.....	.....	153	1,530	765 00
Rice.....	.....	.....	.....	1,320	19,800	9,900 00
Riley.....	.....	.....	.....	203	3,045	1,522 50
Rooks.....	14	140	63 00	1,019	10,190	5,095 00
Rush.....	27	81	36 45	860	2,580	1,290 00
Russell.....	506	5,060	2,277 00	2,695	16,170	8,085 00
Saline.....	33	165	74 25	519	2,595	1,297 50
Scott.....	43	516	232 20	240	4,320	2,160 00
Sedgwick.....	35	700	315 00	221	2,210	1,105 00
Seward.....	228	1,140	513 00	1,061	10,610	5,305 00
Shawnee.....	.....	.....	.....	57	1,140	570 00
Sheridan.....	5	25	11 25	268	1,340	670 00
Sherman.....	.....	.....	.....	60	300	150 00
Smith.....	.....	.....	.....	32	96	48 00
Stafford.....	91	455	204 75	1,505	30,100	15,050 00
Stanton.....	875	12,250	5,612 50	1,018	10,180	5,090 00
Stevens.....	431	4,310	1,939 50	1,248	12,480	6,240 00
Sumner.....	183	1,830	823 50	820	8,200	4,100 00
Thomas.....	1	10	4 50	319	3,190	1,595 00
Trego.....	6	60	27 00	874	4,370	2,185 00
Wabaunsee.....	2	40	18 00	246	4,182	2,091 00
Wallace.....	40	200	90 00	825	4,125	2,062 50
Washington.....	19	380	171 00	84	1,680	840 00
Wichita.....	102	510	229 50	623	3,115	1,557 50
Wilson.....	15	300	135 00	502	10,040	5,020 00
Woodson.....	85	1,700	765 00	877	17,540	8,770 00
Wyandotte.....	.....	.....	.....	.....	.....	.....
Totals.....	8,720	110,070	\$49,531 50	95,237	1,258,912	\$629,456 00

JERUSALEM CORN.

Product estimated in tons for 1893; in bushels for 1894.

TABLE showing the number of acres, product and value for the year 1893.

COUNTIES.	1893.		
	Acres.	Tons.	Value.
Allen.....	21	42	\$126 00
Anderson.....	25	50	150 00
Atchison.....			
Barber.....			
Barton.....	5	10	30 00
Bourbon.....	6	18	54 00
Brown.....			
Butler.....	81	162	486 00
Chase.....			
Chautauqua.....	28	56	168 00
Cherokee.....	10	20	60 00
Cheyenne.....	2	4	12 00
Clark.....	13	26	78 00
Clay.....	10	20	60 00
Cloud.....	5	10	30 00
Coffey.....	37	74	222 00
Comanche.....	70	140	420 00
Cowley.....	12	36	108 00
Crawford.....	2	4	12 00
Decatur.....	11	22	66 00
Dickinson.....	16	48	144 00
Doniphan.....			
Douglas.....	7	14	42 00
Edwards.....	15	23	69 00
Elk.....	33	99	297 00
Ellis.....	371	742	2,226 00
Ellsworth.....	5	10	30 00
Finney.....	2,147	4,294	12,882 00
Ford.....	68	68	204 00
Franklin.....			
Geary.....			
Gove.....	247	494	1,482 00
Graham.....	83	208	624 00
Grant.....	1,033	1,550	4,650 00
Gray.....	53	80	240 00
Greeley.....	722	1,083	3,249 00
Greenwood.....	69	138	414 00
Hamilton.....	1,584	3,167	9,504 00
Harper.....	39	78	234 00
Harvey.....			
Haskell.....	259	389	1,167 00
Hodgeman.....	130	130	390 00
Jackson.....	1	2	6 00
Jefferson.....			
Jewell.....			
Johnson.....			
Kearny.....	2,018	4,036	12,108 00
Kingman.....	4	8	24 00
Kiowa.....	10	15	45 00
Labette.....	2	4	12 00
Lane.....	171	257	771 00
Leavenworth.....			
Lincoln.....	14	28	84 00
Linn.....	1	2	6 00
Logan.....	407	407	1,221 00
Lyon.....	4	8	24 00
Marion.....			
Marshall.....			
McPherson.....			
Meade.....	60	90	270 00
Miami.....			
Mitchell.....	11	22	66 00
Montgomery.....			
Morris.....	3	9	27 00
Morton.....	772	772	2,316 00
Nemaha.....	8	16	48 00
Neosho.....	561	1,122	3,366 00
Ness.....	185	463	1,389 00
Norton.....	7	11	33 00
Osage.....			
Osborne.....	15	45	135 00
Ottawa.....	42	63	189 00
Pawnee.....	85	128	384 00
Phillips.....	17	26	78 00

JERUSALEM CORN — CONTINUED.

COUNTIES.	1893.		
	Acres.	Tons.	Value.
Pottawatomie.....	18	36	108 00
Pratt.....			
Rawlins.....	57	86	\$258 00
Reno.....			
Republic.....	4	6	18 00
Rice.....			
Riley.....	2	3	9 00
Rooks.....	8	12	36 00
Rush.....	51	102	306 00
Russell.....	31	47	141 00
Saline.....	5	10	30 00
Scott.....	601	601	1,803 00
Sedgwick.....	3	6	18 00
Seward.....	144	216	648 00
Shawnee.....			
Sheridan.....	136	204	612 00
Sherman.....	127	191	573 00
Smith.....	2	4	12 00
Stafford.....	28	42	126 00
Stanton.....	2,299	2,299	6,897 00
Stevens.....	691	691	2,073 00
Sumner.....			
Thomas.....	183	183	549 00
Trego.....	96	96	288 00
Wabaunsee.....			
Wallace.....	324	324	972 00
Washington.....	25	75	225 00
Wichita.....	532	798	2,394 00
Wilson.....	27	54	162 00
Woodson.....	16	32	96 00
Wyandotte.....			
Totals.....	17,027	26,962	\$80,886 00

JERUSALEM CORN — CONTINUED.

TABLE showing the number of acres, product and value for the year 1894.

COUNTIES.	1894.		
	Acres.	Bushels.	Value.
Allen.....	25	625	\$312 50
Anderson.....	14	280	140 00
Atchison.....			
Barber.....	67	3,350	1,675 00
Barton.....	17	340	170 00
Bourbon.....			
Brown.....			
Butler.....	41	615	307 50
Chase.....			
Chautauqua.....	6	120	60 00
Cherokee.....	3	60	30 00
Cheyenne.....	30	240	120 00
Clark.....	12	84	42 00
Clay.....	11	110	55 00
Cloud.....	17	170	85 00
Coffey.....	12	420	210 00
Comanche.....	20	500	250 00
Cowley.....	55	1,100	550 00
Crawford.....	5	75	37 50
Decatur.....	5	50	25 00
Dickinson.....	60	600	300 00
Doniphan.....			
Douglas.....			
Edwards.....	15	150	75 00
Elk.....	7	140	70 00
Ellis.....	648	3,240	1,620 00
Ellsworth.....	8	80	40 00
Finney.....	2,512	50,240	25,120 00
Ford.....	53	477	238 50
Franklin.....	1	24	12 00
Geary.....			

JERUSALEM CORN—CONCLUDED.

COUNTIES.	1894.		
	Acres.	Busbels.	Value.
Gove.....	150	1,800	\$900 00
Graham.....	157	4,710	2,355 00
Grant.....	1,321	19,815	9,907 50
Gray.....	115	1,150	575 00
Greeley.....	804	8,040	4,020 00
Greenwood.....	13	260	130 00
Hamilton.....	1,853	14,824	7,412 00
Harper.....	31	310	155 00
Harvey.....	3	45	22 50
Haskell.....	406	8,120	4,060 00
Hodgeman.....	295	5,900	2,950 00
Jackson.....			
Jefferson.....			
Jewell.....			
Johnson.....			
Kearny.....	1,550	31,180	15,590 00
Kingman.....	4	40	20 00
Kiowa.....	26	130	65 00
Labette.....			
Lane.....	355	3,550	1,775 00
Leavenworth.....			
Lincoln.....	5	50	25 00
Linn.....	2	40	20 00
Logan.....	574	5,740	2,870 00
Lyon.....	16	320	160 00
Marion.....	1	8	4 00
Marshall.....	5	75	37 50
McPherson.....	12	180	90 00
Meade.....	15	150	75 00
Miami.....			
Mitchell.....	240	2,400	1,200 00
Montgomery.....	6	120	60 00
Morris.....			
Morton.....	721	2,884	1,442 00
Nemaha.....	1	20	10 00
Neosho.....	1	25	12 50
Ness.....	1,439	35,975	17,987 50
Norton.....	52	520	260 00
Osage.....			
Osborne.....	27	270	135 00
Ottawa.....	19	95	47 50
Pawnee.....	164	1,640	820 00
Phillips.....			
Pottawatomie.....			
Pratt.....	20	400	200 00
Rawlins.....	74	1,110	555 00
Reno.....	5	50	25 00
Republic.....	29	203	101 50
Rice.....			
Riley.....			
Rooks.....	99	2,475	1,237 50
Rush.....	511	2,555	1,277 50
Russell.....	33	198	99 00
Saline.....	10	50	25 00
Scott.....	762	15,240	7,620 00
Sedgwick.....	2	50	25 00
Seward.....	189	945	472 50
Shawnee.....			
Sheridan.....	64	320	160 00
Sherman.....	63	315	157 50
Smith.....			
Stafford.....	24	120	60 00
Stanton.....	1,716	8,580	4,290 00
Stevens.....	734	7,340	3,670 00
Sumner.....	22	220	110 00
Thomas.....	178	1,780	890 00
Trego.....	422	4,220	2,110 00
Wabauaasee.....			
Wallace.....	227	1,135	567 50
Washington.....	12	240	120 00
Wichita.....	741	3,705	1,852 50
Wilson.....	3	60	30 00
Woodson.....	142	3,550	1,775 00
Wyandotte.....			
Totals.....	20,118	268,337	\$134,168 50

TAME GRASSES.

TABLE showing the number of acres for the year 1893.

COUNTIES.	Timothy.	Clover.	Blue grass.	Alfalfa.	Orchard grass.	Other tame grasses.
Allen.....	7,998	2,839	1,839	23	28	999
Anderson.....	18,673	2,926	1,828	.....	9	311
Atchison.....	22,945	2,256	12,323	26	16	792
Barber.....	16	11	4	902	.....	1
Barton.....	.....	.....	1	794	.....	.....
Bourbon.....	22,248	1,556	277	7	86	1,207
Brown.....	36,469	3,538	3,728	33	49	1,566
Butler.....	1,476	574	1,294	1,576	167	245
Chase.....	119	257	227	2,290	42	38
Chautauqua.....	248	223	87	1,029	47	106
Cherokee.....	10,817	277	515	73	25	5,766
Cheyenne.....	45	42	.....	804	1	.....
Clark.....	11	.....	.....	814	.....	9
Clay.....	2,710	95	630	232	77	53
Cloud.....	2,074	169	125	4,232	144	99
Coffey.....	9,375	2,330	5,487	49	16	726
Comanche.....	.....	.....	5	38	.....	.....
Cowley.....	1,373	449	1,240	670	274	49
Crawford.....	22,137	1,061	1,822	1	10	638
Decatur.....	.....	17	20	.....	497	23
Dickinson.....	3,090	482	1,180	2,121	61	361
Doniphan.....	14,777	6,534	1,368	.....	28	1,842
Douglas.....	26,686	2,452	4,238	9	30	57
Edwards.....	.....	.....	.....	481	40	3
Elk.....	1,091	1,263	635	390	7	326
Ellis.....	7	.....	.....	106	.....	.....
Ellsworth.....	2	1	4	268	10	14
Finney.....	2	.....	1	6,990	1	15
Ford.....	3	4	.....	1,779	17	.....
Franklin.....	28,974	3,435	4,740	20	9	1,484
Geary.....	209	3	39	524	97	55
Gove.....	.....	.....	.....	2	.....	161
Graham.....	11	2	2	22	.....	.....
Grant.....	.....	.....	.....	.....	.....	.....
Gray.....	.....	.....	.....	1,171	.....	.....
Greeley.....	.....	.....	.....	2	.....	.....
Greenwood.....	1,136	2,132	3,664	601	164	861
Hamilton.....	.....	1	.....	1,390	3	125
Harper.....	30	9	14	495	150	19
Harvey.....	1,382	541	549	1,011	116	118
Haskell.....	.....	.....	.....	.....	.....	203
Hodgeman.....	.....	.....	.....	24	.....	.....
Jackson.....	28,529	2,018	1,991	64	61	550
Jefferson.....	32,879	1,834	11,864	2	83	928
Jewell.....	1,305	328	139	2,262	51	33
Johnson.....	37,161	4,635	16,609	13	.....	3,979
Kearny.....	4	.....	.....	3,857	.....	10
Kingman.....	55	2	3	400	1	19
Kiowa.....	.....	.....	.....	106	.....	.....
Labette.....	10,508	1,175	1,369	24	13	780
Lane.....	.....	.....	.....	57	.....	.....
Leavenworth.....	20,672	2,067	24,288	83	16	10,229
Lincoln.....	14	26	.....	555	29	.....
Linn.....	33,260	3,216	533	17	5	1,212
Logan.....	.....	.....	.....	39	.....	4
Lyon.....	3,189	2,007	664	1,408	258	199
Marion.....	1,387	1,112	274	2,226	143	249
Marshall.....	11,810	3,794	1,133	.....	109	485
McPherson.....	1,355	589	165	2,057	44	211
Meade.....	.....	.....	.....	896	.....	5
Miami.....	42,892	5,383	3,351	21	30	2,882
Mitchell.....	494	57	35	3,502	.....	18
Montgomery.....	4,410	955	839	39	285	1,173
Morris.....	2,829	543	440	248	62	183
Morton.....	.....	.....	.....	.....	.....	5
Nemaha.....	31,266	3,370	927	102	34	2,761
Neosho.....	12,205	813	947	2,660	1,290	2,519
Ness.....	.....	.....	.....	51	.....	.....
Norton.....	79	7	1	1,109	.....	42
Osage.....	14,825	2,701	1,274	30	139	1,469
Osborne.....	72	10	68	1,759	29	56
Ottawa.....	655	65	246	1,958	3	60
Pawnee.....	.....	.....	2	520	.....	.....
Phillips.....	59	14	45	559	6	18
Pottawatomie.....	8,370	1,291	1,722	617	84	122
Pratt.....	21	.....	10	181	7	5

TAME GRASSES—CONTINUED.

COUNTIES.	Timothy.	Clover.	Blue grass.	Alfalfa.	Orchard grass.	Other tame grasses.
Rawlins.....	10	23	1	528	4	18
Reno.....	99	115	1	1,835	14	14
Republic.....	4,457	1,102	374	1,603	92	824
Rice.....	100	37	91	1,354	10	52
Riley.....	781	378	435	942	182	84
Rooks.....	13	1	6	339	.....	10
Rush.....	101	1	.....	89	.....	.....
Russell.....	.....	.....	.....	289	.....	1
Saline.....	215	23	507	3,252	65	30
Scott.....	.....	.....	.....	29	.....	.....
Sedgwick.....	556	195	182	1,850	136	284
Seward.....	1	.....	1	30	.....	.....
Shawnee.....	11,086	2,233	1,876	118	106	1,613
Sheridan.....	7	.....	.....	230	.....	.....
Sherman.....	.....	13	.....	56	2	4
Smith.....	306	17	98	589	14	21
Stafford.....	.....	5	2	184	10	5
Stanton.....	.....	.....	5	10	.....	.....
Stevens.....	.....	.....	.....	13	.....	.....
Sumner.....	1,010	279	350	765	38	148
Thomas.....	24	21	.....	96	.....	.....
Trego.....	.....	.....	.....	7	.....	.....
Wabaunsee.....	4,311	796	438	1,971	121	290
Wallace.....	3	.....	.....	199	.....	21
Washington.....	5,921	1,042	780	248	71	149
Wichita.....	6	.....	.....	3	.....	10
Wilson.....	5,506	1,583	995	59	2	112
Woodson.....	1,988	517	627	50	19	101
Wyandotte.....	4,404	1,485	3,333	31	132	990
Totals.....	577,343	83,346	126,927	75,200	6,021	53,259

TAME GRASSES—CONTINUED.

TABLE showing the number of acres for the year 1894.

COUNTIES.	Timothy.	Clover.	Blue grass.	Alfalfa.	Orchard grass.	Other tame grasses.
Allen.....	12,791	1,719	1,632	30	33	456
Anderson.....	20,307	1,831	698	1	4	2,657
Atchison.....	20,202	2,999	10,909	31	29	1,488
Barber.....	.....	7	.....	856	10	23
Barton.....	6	.....	.....	975	.....	.....
Bourbon.....	22,593	799	107	2	60	448
Brown.....	30,879	4,451	4,164	29	79	1,903
Butler.....	699	205	1,119	2,610	58	190
Chase.....	86	101	162	2,688	86	40
Chautauqua.....	255	24	124	1,747	5	180
Cherokee.....	11,395	84	531	3	10	4,284
Cheyenne.....	20	12	.....	657	291	.....
Clark.....	.....	.....	.....	615	.....	.....
Clay.....	821	31	622	159	23	38
Cloud.....	378	30	63	4,312	12	59
Coffey.....	11,740	2,447	5,516	21	5	706
Comanche.....	2	.....	.....	62	.....	1
Cowley.....	1,029	205	991	1,210	189	29
Crawford.....	19,953	708	1,540	.....	50	2,277
Decatur.....	4	12	.....	782	.....	15
Dickinson.....	1,851	181	1,315	2,310	9	67
Doniphan.....	13,913	8,719	1,741	12	12	912
Douglas.....	24,295	2,844	5,286	19	45	1,178
Edwards.....	4	.....	.....	1,155	.....	.....
Elk.....	1,495	969	889	956	38	207
Ellis.....	.....	.....	.....	125	.....	.....
Ellsworth.....	2	.....	2	168	3	.....
Finney.....	.....	601	.....	9,128	.....	51
Ford.....	.....	.....	.....	1,790	.....	.....
Franklin.....	30,988	3,427	4,622	58	15	2,280

TAME GRASSES—CONCLUDED.

COUNTIES.	Timothy.	Clover.	Blue grass.	Alfalfa.	Orchard grass.	Other tame grasses.
Geary.....	216	3	29	622	46	80
Gove.....	1			35		
Graham.....			3	57		
Grant.....						
Gray.....				893		
Greeley.....						
Greenwood.....	1,164	1,309	5,135	862	157	744
Hamilton.....				1,593		
Harper.....		7	23	952		
Harvey.....	783	115	402	1,053	102	40
Haskell.....				5		
Hodgeman.....				63		
Jackson.....	24,713	844	1,501	46		1,180
Jefferson.....	24,991	2,459	9,127	55	46	3,891
Jewell.....	408	15	113	3,999	11	18
Johnson.....	33,167	4,826	18,162	23		9,741
Kearny.....				3,900		
Kingman.....	72	3	19	556	3	18
Kiowa.....	2			27		
Labette.....	13,499	710	1,710	56	20	2,854
Lane.....		4		109		
Leavenworth.....	19,529	2,166	26,641	34	34	8,356
Lincoln.....				507	3	15
Linn.....	33,264	3,053	1,031	24	42	1,427
Logan.....				4		
Lyon.....	3,107	1,774	838	1,617	204	287
Marion.....	640	229	236	3,048	37	190
Marshall.....	7,511	301	1,530	313	36	443
McPherson.....	1,955	57	596	1,812	17	101
Meade.....				958		
Miami.....	44,774	3,387	4,283	15	194	2,832
Mitchell.....	146	4	185	4,408	6	50
Montgomery.....	5,123	1,271	833	28	263	575
Morris.....	1,931	139	811	322	71	203
Morton.....						
Nemaha.....	22,156	1,287	1,860	151	20	2,895
Neosho.....	14,671	535	1,349	39	25	235
Ness.....		4				
Norton.....	16	23	5	1,295	2	44
Osage.....	17,558	2,322	1,486	95	98	281
Osborne.....	11		44	2,422		1,585
Ottawa.....	342	6	208	2,127		20
Pawnee.....		1		938		
Phillips.....	6		2	668	15	
Pottawatomie.....	5,880	326	1,134	917	78	280
Pratt.....	2		10	157		8
Rawlins.....	13		1	582		8
Reno.....	50	46	52	3,447	23	58
Republic.....	1,231	119	388	1,737	58	458
Rice.....	61	15	62	1,716	5	
Riley.....	249	95	321	835	40	268
Rooks.....		15	5	280		29
Rush.....		1		109		
Russell.....				324		
Saline.....	421	42	638	3,957	53	70
Scott.....				41		
Sedgwick.....	368	47	346	2,563	193	69
Seward.....				26		
Shawnee.....	9,917	2,516	1,737	97	78	800
Sheridan.....				329		
Sherman.....				154		
Smith.....	73	9	29	779	30	47
Stafford.....	1	3	2	274	12	12
Stanton.....						
Stevens.....						
Sumner.....	602	75	363	1,070	26	17
Thomas.....			2	13		
Trego.....				7		
Wabaunsee.....	3,163	700	506	2,334	17	170
Wallace.....			11	111		
Washington.....	1,737	109	495	316	16	158
Wichita.....				38		10
Wilson.....	6,709	1,348	900	261	10	128
Woodson.....	3,074	509	413	100	49	374
Wyandotte.....	5,119	1,239	1,884	9	142	1,760
Totals.....	536,134	66,474	129,485	90,825	3,352	62,323

TAME HAY.

TABLE showing number of tons cut in 1892 and 1893.

COUNTIES.	1892.		1893.	
	Tons.	Value.	Tons.	Value.
Allen.....	5,355	\$32,130	8,353	\$50,118
Anderson.....	10,027	60,162	16,272	97,632
Atchison.....	13,304	79,924	13,308	79,848
Barber.....	10,587	63,522	595	3,570
Barton.....	1,798	10,788	4,000	24,000
Bourbon.....	15,739	94,434	16,502	99,012
Brown.....	23,887	143,322	18,393	110,358
Butler.....	4,969	29,814	3,883	23,298
Chase.....	6,157	36,942	9,186	55,116
Chautauqua.....	3,102	18,612	2,018	12,108
Cherokee.....	8,949	53,694	7,091	42,546
Cheyenne.....	3,600	21,600	1,784	10,704
Clark.....	1,755	10,530	578	3,468
Clay.....	4,643	27,858	5,991	35,946
Cloud.....	5,717	34,302	5,751	34,506
Coffey.....	5,139	30,834	8,037	48,222
Comanche.....	1,745	10,470	239	1,434
Cowley.....	3,244	19,464	1,502	9,012
Crawford.....	17,164	102,984	11,371	68,226
Decatur.....	2,941	17,646	2,796	16,776
Dickinson.....	3,475	20,850	3,589	21,534
Doniphan.....	10,188	61,128	7,764	46,584
Douglas.....	17,483	104,898	17,769	106,614
Edwards.....	2,451	14,706	1,114	6,684
Elk.....	5,827	34,962	4,380	26,280
Ellis.....	2,587	15,522	10,074	60,444
Ellsworth.....	3,074	18,444	2,177	13,062
Finney.....	16,676	100,056	14,589	87,534
Ford.....	4,125	24,750	1,357	8,142
Franklin.....	18,255	109,530	23,438	140,628
Geary.....	522	3,132	1,181	7,086
Gove.....	308	1,848	590	3,540
Graham.....	3,754	22,524	2,238	13,428
Grant.....	25	150	.....	.....
Gray.....	2,180	13,080	648	3,888
Greeley.....	.....	.....	7	42
Greenwood.....	3,325	19,950	4,929	29,574
Hamilton.....	2,588	15,528	3,086	18,516
Harper.....	1,355	8,130	63	378
Harvey.....	1,471	8,826	1,010	6,060
Haskell.....	349	2,094	.....	.....
Hodgeman.....	393	2,358	329	1,974
Jackson.....	16,349	98,094	15,428	92,568
Jefferson.....	13,684	82,104	16,590	99,540
Jewell.....	6,659	39,954	8,557	51,342
Johnson.....	21,375	128,250	25,149	150,894
Kearny.....	5,052	30,312	5,439	32,634
Kingman.....	581	3,486	72	432
Kiowa.....	1,928	11,568	106	636
Labette.....	8,915	53,490	7,923	47,538
Lane.....	62	372	643	3,858
Leavenworth.....	20,243	121,458	21,891	131,346
Lincoln.....	1,829	10,974	803	4,818
Linn.....	16,530	99,180	27,176	163,056
Logan.....	114	684	557	3,342
Lyon.....	5,202	31,212	6,147	36,882
Marion.....	4,880	29,280	2,960	17,760
Marshall.....	18,394	110,364	14,930	89,580
McPherson.....	4,172	25,032	3,712	22,272
Meade.....	1,494	8,964	1,478	8,868
Miami.....	21,290	127,740	23,188	139,128
Mitchell.....	4,017	24,102	4,270	25,620
Montgomery.....	4,599	27,594	4,699	28,194
Morris.....	3,647	21,882	5,177	31,062
Morton.....	77	462	.....	.....
Nemaha.....	20,567	123,402	17,197	103,182
Neosho.....	9,328	55,968	8,491	50,946
Ness.....	1,394	8,004	6,871	41,226
Norton.....	3,169	19,014	5,097	30,582
Osage.....	8,758	52,548	13,085	78,510
Osborne.....	3,062	18,372	3,562	21,372
Ottawa.....	2,371	14,226	2,582	15,492
Pawnee.....	5,834	35,004	5,628	33,768
Phillips.....	2,722	16,332	1,640	9,840
Pottawatomie.....	9,289	55,734	9,743	58,458

TAME HAY—CONCLUDED.

COUNTIES.	1892.		1893.	
	Tons.	Value.	Tons.	Value.
Pratt.....	291	\$1,746	173	\$1,038
Rawlins.....	1,959	11,754	3,496	20,976
Reno.....	3,087	18,522	4,433	26,598
Republic.....	7,459	44,754	6,106	36,636
Rice.....	1,839	11,034	1,539	9,234
Riley.....	3,348	20,088	3,208	19,248
Rooks.....	3,194	19,164	3,873	23,238
Rush.....	8,788	52,728	11,050	66,300
Russell.....	408	2,448	991	5,946
Saline.....	3,205	19,230	4,313	25,878
Scott.....	52	312	58	348
Sedgwick.....	2,262	13,572	1,607	9,642
Seward.....	334	2,004	195	1,170
Shawnee.....	7,282	43,692	7,118	42,708
Sheridan.....	1,474	8,844	1,764	10,584
Sherman.....	239	1,434	58	348
Smith.....	3,627	21,762	3,211	19,266
Stafford.....	1,458	8,748	2,817	16,902
Stanton.....	60	360	.....	.....
Stevens.....	132	792	2	12
Sumner.....	1,422	8,532	605	3,630
Thomas.....	1,337	8,022	787	4,722
Trego.....	2,064	12,384	2,930	17,580
Wabaunsee.....	7,642	45,852	9,970	59,820
Wallace.....	106	636	568	3,408
Washington.....	6,852	41,112	5,956	35,736
Wichita.....	63	378	156	936
Wilson.....	4,544	27,264	5,832	34,992
Woodson.....	3,434	20,604	3,232	19,392
Wyandotte.....	4,822	28,932	4,036	24,216
Totals.....	580,544	\$3,483,364	598,857	\$3,593,142

PRAIRIE GRASS.

TABLE showing acres under fence and tons of hay cut.

COUNTIES.	Prairie under fence, acres, 1893.	PRAIRIE HAY CUT, 1892.		Prairie under fence, acres, 1894.	PRAIRIE HAY CUT, 1893.	
		Tons.	Value.		Tons.	Value.
Allen.....	46,552	19,631	\$49,077 50	58,808	25,566	\$76,698
Anderson.....	68,575	17,876	53,628 00	65,248	23,551	94,204
Atchison.....	7,313	4,478	17,912 00	7,802	3,814	19,070
Barber.....	23,991	3,824	15,296 00	66,790	1,002	5,010
Barton.....	34,344	17,228	77,526 00	54,138	11,536	46,144
Bourbon.....	51,871	22,155	72,003 75	37,013	20,760	62,280
Brown.....	17,566	5,863	32,246 50	11,989	6,197	37,182
Butler.....	101,953	70,946	319,257 00	162,163	53,363	213,452
Chase.....	54,276	25,092	100,368 00	88,011	22,500	90,000
Chautauqua.....	31,570	15,407	38,517 50	48,837	14,016	42,048
Cherokee.....	34,737	26,118	104,472 00	31,444	17,588	87,940
Cheyenne.....	19,899	4,502	22,510 00	21,433	3,069	18,414
Clark.....	9,568	1,391	6,955 00	52,669	2,172	8,688
Clay.....	94,971	19,661	88,474 50	83,383	18,843	94,215
Cloud.....	65,004	14,697	73,485 00	79,309	11,736	46,944
Coffey.....	90,411	36,508	82,143 00	82,621	45,144	135,432
Comanche.....	6,185	1,222	5,499 00	11,386	1,083	3,249
Cowley.....	114,205	46,190	138,570 00	126,804	24,693	98,772
Crawford.....	28,500	17,191	61,764 00	27,530	12,124	36,372
Decatur.....	21,272	4,499	17,996 00	30,306	5,435	27,175
Dickinson.....	105,055	29,499	95,871 75	114,142	38,502	231,012
Doniphan.....	2,390	1,556	9,336 00	1,074	1,509	9,054
Douglas.....	30,263	12,794	67,168 50	25,067	13,768	68,840
Edwards.....	16,195	4,378	14,228 50	2,837	8,470	25,410
Elk.....	57,038	32,727	73,635 75	98,024	25,131	50,262
Ellis.....	32,505	4,284	17,136 00	32,739	4,643	27,858
Ellsworth.....	25,912	7,793	25,327 25	47,924	7,426	22,278
Finney.....	3,396	871	4,137 25	991	11,762	35,286
Ford.....	11,387	4,703	19,987 75	6,031	6,413	25,652
Franklin.....	68,638	17,983	58,444 75	60,516	19,585	78,340
Geary.....	26,785	10,629	34,544 25	24,543	17,428	69,712

PRAIRIE GRASS—CONCLUDED.

COUNTIES.	Prairie under fence, acres, 1893.	PRAIRIE HAY CUT, 1892.		Prairie under fence, acres, 1894.	PRAIRIE HAY CUT, 1893.	
		Tons.	Value.		Tons.	Value.
Gove.....	12,082	1,418	\$4,963 00	5,529	2,400	\$14,400
Graham.....	16,984	6,080	24,320 00	17,479	5,069	20,276
Grant.....	2,880	628	4,710 00	975	631	3,786
Gray.....	4,393	2,331	9,324 00	4,093	1,322	5,288
Greeley.....	365			730	36	144
Greenwood.....	168,486	48,536	145,608 00	133,422	57,248	171,744
Hamilton.....	7,485	2,677	10,708 00	6,038	2,294	9,176
Harper.....	91,393	9,502	47,510 00	56,873	2,523	10,092
Harvey.....	75,856	26,364	145,002 00	76,059	12,427	37,281
Haskell.....	1,185	703	3,515 00	3,632	188	376
Hodgeman.....	6,082	1,597	5,589 50	4,640	2,259	9,036
Jackson.....	62,838	23,001	92,004 00	66,901	26,652	133,260
Jefferson.....	24,999	11,858	50,396 50	25,842	14,066	56,264
Jewell.....	95,575	16,779	83,895 00	100,045	12,630	50,520
Johnson.....	4,624	3,251	11,378 50	5,080	4,667	23,335
Kearny.....	2,730	1,575	5,906 25	2,963	1,029	4,116
Kingman.....	71,110	16,984	67,936 00	54,826	7,920	31,680
Kiowa.....	10,831	1,903	9,515 00	11,850	1,253	6,265
Labette.....	27,770	15,448	54,068 00	29,288	12,041	48,164
Lane.....	5,683	1,207	6,638 50	5,063	1,274	3,822
Leavenworth.....	18,588	7,521	37,605 00	14,201	7,100	49,700
Lincoln.....	65,988	10,470	34,027 50	55,558	13,911	41,733
Linn.....	40,933	11,864	35,592 00	40,272	14,440	57,760
Logan.....	4,037	1,746	9,603 00	2,534	2,060	10,300
Lyon.....	114,142	41,626	124,378 00	118,787	59,291	237,164
Marion.....	77,612	47,782	222,214 50	74,800	23,751	71,253
Marshall.....	89,846	23,266	98,880 00	109,035	21,969	109,845
McPherson.....	89,818	28,287	113,148 00	94,958	19,997	79,988
Meade.....	12,552	3,932	13,762 00	8,070	4,443	13,344
Miami.....	16,785	7,250	25,375 00	19,522	8,986	44,930
Mitchell.....	70,881	9,060	27,180 00	59,458	10,557	42,228
Montgomery.....	29,902	17,702	61,957 00	29,860	15,077	60,308
Morris.....	63,210	26,029	65,072 50	73,013	33,725	101,175
Morton.....	3,802	480	2,160 00	1,310	424	1,696
Nemaha.....	79,523	21,341	80,028 75	72,435	19,628	117,768
Neosho.....	34,101	18,241	54,723 00	37,204	23,404	93,616
Ness.....	33,669	2,197	8,788 00	30,974	3,648	14,592
Norton.....	32,692	8,922	44,610 00	95,407	10,035	40,140
Osage.....	102,202	30,255	105,892 50	101,328	37,476	149,904
Osborne.....	55,338	10,538	48,845 00	41,802	23,664	70,992
Ottawa.....	83,743	12,584	47,190 00	65,008	13,404	67,020
Pawnee.....	12,998	3,945	11,835 00	16,348	6,829	27,316
Phillips.....	58,985	19,194	91,171 50	57,994	16,546	82,730
Pottawatomie.....	135,482	44,254	143,825 50	173,853	41,467	207,335
Pratt.....	30,286	2,350	10,575 00	21,178	1,238	6,190
Rawlins.....	19,834	5,753	27,326 75	8,352	3,468	20,808
Reno.....	101,208	39,423	197,115 00	120,110	22,501	90,004
Republic.....	56,446	15,426	100,269 00	50,858	5,598	27,990
Rice.....	62,244	16,316	73,417 50	59,399	9,210	36,840
Riley.....	54,107	17,821	62,373 50	54,904	21,466	107,330
Rooks.....	54,678	9,648	36,180 00	46,218	11,257	45,028
Rush.....	44,920	2,845	9,246 25	46,904	2,983	14,915
Russell.....	41,455	12,799	41,596 75	44,880	11,346	45,384
Saline.....	49,182	16,057	52,185 25	60,083	18,776	93,880
Scott.....	5,514		5,550 00	4,796	768	3,072
Sedgwick.....	105,070	40,969	204,845 00	107,449	21,883	65,649
Seward.....	4,243	3,617	10,851 00	5,840	2,983	8,949
Shawnee.....	86,945	30,972	108,402 00	69,138	38,560	192,800
Sheridan.....	2,151	4,011	16,044 00	10,787	3,017	9,051
Sherman.....	4,795	448	2,688 00	2,363	381	1,143
Smith.....	78,659	18,884	75,536 00	57,724	19,474	77,896
Stafford.....	27,351	10,065	30,195 00	19,841	14,497	57,988
Stanton.....	80	40	240 00	2,775		
Stevens.....	445	209	1,045 00	1,445	82	246
Sumner.....	128,697	27,586	137,930 00	127,168	5,734	22,936
Thomas.....	8,951	1,561	4,683 00	8,296	813	3,252
Trego.....	5,957	2,594	12,970 00	3,872	2,824	11,296
Wabaunsee.....	141,524	39,893	109,705 75	130,554	45,196	180,784
Wallace.....	2,750	1,375	7,906 25	3,717	1,604	6,416
Washington.....	78,284	22,727	119,316 75	84,681	15,544	46,632
Wichita.....	3,368	275	1,650 00	8,430	571	2,284
Wilson.....	59,603	20,857	83,428 00	66,543	25,239	100,956
Woodson.....	78,806	45,412	136,236 00	72,780	45,698	137,094
Wyandotte.....	157	40	230 00	2	40	280
Totals.....	4,750,207	1,521,106	\$5,775,606 75	4,867,720	1,431,346	\$5,735,948

CORN AND WHEAT ON HAND.

TABLE showing the number of bushels on hand March 1, 1893 and 1894.

COUNTIES.	1893.		1894.	
	Corn.	Wheat.	Corn.	Wheat.
Allen.....	228,562	1,436	217,322	15,999
Anderson.....	263,355	1,641	259,850	16,631
Atchison.....	536,333	59,055	673,150	41,886
Barber.....	52,154	39,159	7,040	20,070
Barton.....	392,531	693,228	68,745	197,843
Bourbon.....	175,737	5,782	244,895	17,203
Brown.....	1,244,920	184,754	2,036,572	108,397
Butler.....	577,370	97,011	265,698	67,764
Chase.....	186,040	17,231	111,700	24,907
Chautauqua.....	106,122	13,864	73,381	37,773
Cherokee.....	116,734	38,010	102,054	39,165
Cheyenne.....	181,110	86,323	54,993	37,141
Clark.....	5,105	10,075	654	2,331
Clay.....	763,477	231,846	489,895	108,868
Cloud.....	774,029	186,698	355,342	110,873
Coffey.....	514,947	4,221	466,936	21,469
Comanche.....	5,128	6,128	1,155	3,029
Cowley.....	607,318	299,914	153,102	239,040
Crawford.....	203,215	37,547	119,319	46,304
Decatur.....	490,856	110,928	285,604	22,217
Dickinson.....	298,805	419,173	157,901	153,217
Doniphan.....	740,254	204,180	719,263	115,075
Douglas.....	467,079	64,706	493,202	79,859
Edwards.....	24,577	70,089	10,290	21,779
Elk.....	299,482	7,182	124,279	29,479
Ellis.....	39,465	145,883	13,318	28,803
Ellsworth.....	165,845	275,849	85,604	118,985
Finney.....	723	7,922	19	357
Ford.....	13,542	37,312	894	7,533
Franklin.....	504,853	17,401	475,019	35,262
Geary.....	77,822	66,280	127,000	37,596
Gove.....	17,224	16,847	1,017	291
Graham.....	188,587	57,020	34,191	14,898
Grant.....	3,138	6,823	10	40
Gray.....	525	11,453	202	583
Greeley.....	3,143	5,386	160	310
Greenwood.....	362,136	2,878	283,158	16,223
Hamilton.....	637	4,528	40	50
Harper.....	182,136	159,633	16,147	65,946
Harvey.....	369,463	322,321	88,746	212,543
Haskell.....	2,547	25,165	152	1,251
Hodgeman.....	2,615	21,577	874	4,521
Jackson.....	809,085	20,349	1,074,832	7,338
Jefferson.....	689,003	59,350	756,434	50,518
Jewell.....	1,672,577	129,313	816,818	60,524
Johnson.....	416,350	80,670	470,285	79,398
Kearny.....	1,697	23,175	220	520
Kingman.....	226,658	104,068	34,394	71,367
Kiowa.....	10,626	18,103	2,510	12,316
Labette.....	123,771	43,452	87,326	72,826
Lane.....	1,543	19,279	20	190
Leavenworth.....	364,583	131,769	404,615	100,863
Lincoln.....	209,465	292,206	123,630	99,803
Linn.....	303,319	1,703	243,937	21,594
Logan.....	12,211	32,448	1,309	5,335
Lyon.....	593,168	17,941	472,074	21,971
Marion.....	513,795	291,884	117,633	166,852
Marshall.....	1,062,660	67,422	1,113,978	62,854
McPherson.....	713,113	732,865	149,168	360,120
Meade.....	619	7,336	10	3,035
Miami.....	703,360	24,455	1,034,706	97,782
Mitchell.....	495,896	268,397	251,144	128,841
Montgomery.....	157,335	29,688	203,150	69,008
Morris.....	335,404	46,842	221,157	32,166
Morton.....	221	5,808	155	92
Nemaha.....	892,805	44,024	1,109,591	15,096
Neosho.....	195,900	18,409	149,009	49,411
Ness.....	12,458	52,486	1,576	3,525
Norton.....	854,900	79,614	421,081	37,315
Osage.....	889,481	12,121	578,672	22,981
Osborne.....	604,924	204,400	339,240	82,369
Ottawa.....	200,800	237,710	77,925	101,520
Pawnee.....	16,215	190,785	4,914	42,438
Phillips.....	1,102,486	72,745	414,209	32,777
Pottawatomie.....	682,931	67,514	744,892	57,647

CORN AND WHEAT ON HAND—CONCLUDED.

COUNTIES.	1893.		1894.	
	Corn.	Wheat.	Corn.	Wheat.
Pratt.....	46,651	96,816	4,968	16,877
Rawlins.....	294,762	100,193	149,166	34,493
Reno.....	1,137,431	306,167	305,204	183,237
Republic.....	1,657,820	60,683	660,634	24,344
Rice.....	787,397	445,580	150,867	227,522
Riley.....	342,590	8,263	350,600	58,704
Rooks.....	346,766	98,533	144,963	24,528
Rush.....	33,613	190,081	8,014	30,456
Russell.....	171,946	170,647	73,276	31,760
Saline.....	329,919	563,894	112,444	232,848
Scott.....	432	8,751	.....	.....
Sedgwick.....	826,203	350,784	186,842	211,631
Seward.....	1,315	6,375	193	1,007
Shawnee.....	790,422	36,330	825,320	34,210
Sheridan.....	98,397	35,484	19,089	7,727
Sherman.....	105,945	101,209	21,982	37,973
Smith.....	1,588,803	126,688	663,495	57,651
Stafford.....	206,559	100,822	113,267	87,791
Stanton.....	2,983	8,880	110	102
Stevens.....	1,993	6,335	209	95
Sumner.....	773,574	525,329	105,799	376,353
Thomas.....	73,323	72,252	15,296	11,099
Trego.....	49,128	47,391	9,727	13,125
Wabaunsee.....	516,118	92,304	493,773	60,540
Wallace.....	14,365	13,659	1,532	4,038
Washington.....	1,222,803	142,362	819,721	55,531
Wichita.....	4,015	9,460	519	40
Wilson.....	252,467	27,710	115,343	40,468
Woodson.....	200,666	916	123,528	11,682
Wyandotte.....	78,038	45,756	59,350	23,260
Totals.....	38,015,444	11,302,444	25,574,738	5,992,975

LIVE-STOCK STATISTICS, 1893.

TABLE showing number and value of various kinds of live stock for 1893.

COUNTIES.	HORSES.		MULES AND ASSES.		MILCH COWS.	
	Number.	Value.	Number.	Value.	Number.	Value.
Allen.....	9,019	\$468,988	984	\$61,008	5,994	\$119,880
Anderson.....	9,250	481,000	1,255	77,810	5,966	119,320
Atchison.....	7,880	409,760	1,281	79,422	5,978	119,560
Barber.....	7,647	397,644	1,229	76,198	3,879	77,580
Barton.....	10,261	533,573	1,249	77,438	6,305	126,100
Bourbon.....	11,760	611,520	1,506	93,372	7,373	147,460
Brown.....	13,320	692,640	1,382	85,684	7,696	153,920
Butler.....	17,049	886,548	1,592	98,704	11,858	237,160
Chase.....	6,732	350,064	592	36,704	1,929	38,580
Chautauqua.....	7,866	409,032	1,221	75,702	5,759	115,180
Cherokee.....	9,941	516,932	1,480	91,760	7,182	143,640
Cheyenne.....	4,305	223,860	405	25,110	2,645	52,900
Clark.....	1,579	82,108	194	12,028	977	19,540
Clay.....	13,050	678,600	800	49,600	7,810	156,200
Cloud.....	12,780	664,560	808	50,096	7,899	157,980
Coffey.....	12,027	625,404	1,182	73,284	7,232	144,640
Comanche.....	1,794	93,288	215	13,330	1,533	30,660
Cowley.....	21,323	1,108,796	2,105	130,510	13,014	260,280
Crawford.....	11,292	587,184	1,749	108,438	6,441	128,820
Decatur.....	5,349	278,148	411	25,482	3,479	69,580
Dickinson.....	15,661	814,372	943	58,466	12,228	244,560
Doniphan.....	5,982	311,064	1,478	91,636	4,046	80,920
Douglas.....	13,230	687,960	724	44,888	7,358	147,160
Edwards.....	3,143	163,436	342	21,204	2,854	57,080
Elk.....	9,000	468,000	1,366	84,692	6,661	133,220
Ellis.....	5,569	289,588	423	26,226	2,642	52,840
Ellsworth.....	6,763	351,676	642	39,804	3,673	73,460
Finney.....	1,776	92,352	169	10,478	1,554	31,080
Ford.....	3,149	163,748	286	17,732	2,776	55,520
Franklin.....	12,197	634,244	909	56,358	8,169	163,380
Geary.....	5,189	269,828	228	14,136	3,710	74,200

LIVE-STOCK STATISTICS, 1833—CONTINUED.

COUNTIES.	HORSES.		MULES AND ASSES.		MILCH COWS.	
	Number.	Value.	Number.	Value.	Number.	* Value.
Gove.....	2,452	\$127,504	161	\$9,982	1,349	\$26,980
Graham.....	3,599	187,148	255	15,810	2,674	53,480
Grant.....	1,169	60,788	67	4,154	1,124	22,480
Gray.....	1,521	79,092	194	12,028	1,186	23,720
Greeley.....	1,141	59,332	110	6,820	642	12,840
Greenwood.....	11,609	603,668	1,469	91,078	6,764	135,280
Hamilton.....	1,416	73,632	118	7,316	893	17,860
Harper.....	8,826	458,952	1,390	86,180	5,377	107,540
Harvey.....	10,824	562,848	887	54,994	7,471	149,420
Haskell.....	924	48,048	122	7,564	440	8,800
Hodgeman.....	2,669	138,788	119	7,378	2,340	46,800
Jackson.....	10,015	520,780	1,027*	63,674	7,600	152,000
Jefferson.....	11,732	610,064	1,293	80,166	7,942	158,840
Jewell.....	16,541	860,132	1,369	84,878	9,999	199,980
Johnson.....	9,487	493,324	1,057	65,534	6,289	125,780
Kearny.....	1,167	60,684	184	11,408	690	13,800
Kingman.....	8,069	419,588	1,134	70,308	5,008	100,160
Kiowa.....	2,743	142,636	456	28,272	1,956	39,120
Labette.....	11,606	603,512	1,344	83,328	7,476	149,520
Lane.....	2,163	112,476	159	9,858	1,441	28,820
Leavenworth.....	10,359	538,668	1,439	89,218	7,267	145,340
Lincoln.....	8,866	461,032	633	39,246	5,360	107,200
Linn.....	11,093	576,836	1,609	99,758	6,048	120,960
Logan.....	2,973	154,596	312	19,344	1,497	29,940
Lyon.....	10,838	563,576	1,001	62,062	7,713	154,260
Marion.....	13,025	677,300	512	31,744	9,369	187,380
Marshall.....	17,315	900,380	2,650	164,300	15,316	306,320
McPherson.....	10,382	539,864	628	38,936	9,706	194,120
Meade.....	2,106	109,512	215	13,330	1,202	24,040
Miami.....	12,526	651,352	1,069	66,278	6,907	138,149
Mitchell.....	11,853	616,356	774	47,988	7,996	159,920
Montgomery.....	10,143	527,436	1,505	93,310	7,295	145,900
Morris.....	8,847	460,044	435	26,970	4,866	97,320
Morton.....	609	31,668	73	4,526	321	6,420
Nemaha.....	15,772	820,144	1,272	78,864	10,975	219,500
Neosho.....	10,846	563,992	1,359	84,258	7,323	146,460
Ness.....	5,614	291,928	274	16,988	3,321	66,420
Norton.....	7,769	403,988	659	40,858	5,115	102,300
Osage.....	15,127	786,604	979	60,698	10,041	200,820
Osborne.....	10,747	558,844	601	37,262	6,968	139,360
Ottawa.....	9,778	508,456	782	48,484	6,022	120,440
Pawnee.....	4,765	247,780	367	22,754	2,708	54,160
Phillips.....	10,196	530,192	687	42,594	7,140	142,800
Pottawatomie.....	13,494	701,688	774	47,988	10,872	217,440
Pratt.....	3,231	168,012	1,214	75,268	2,995	59,900
Rawlins.....	9,361	486,772	389	24,118	3,380	67,600
Reno.....	15,686	815,672	2,118	131,316	10,555	211,100
Republic.....	14,513	754,676	1,133	70,246	9,583	191,660
Rice.....	10,355	538,460	1,192	73,904	6,829	136,580
Riley.....	9,109	473,668	473	29,327	8,088	161,760
Rooks.....	6,622	344,344	444	27,528	3,990	79,800
Rush.....	4,844	251,888	369	22,878	2,562	51,240
Russell.....	6,817	354,484	450	27,900	4,229	84,580
Saline.....	9,932	516,464	747	46,314	6,092	121,840
Scott.....	1,490	77,480	88	5,456	843	16,860
Sedgwick.....	16,223	843,596	1,561	96,782	10,730	214,600
Seward.....	623	32,396	73	4,526	707	14,140
Shawnee.....	14,794	769,288	895	55,490	9,369	187,380
Sheridan.....	3,792	197,184	218	13,516	2,059	41,180
Sherman.....	3,902	202,904	417	25,854	2,608	52,160
Smith.....	12,663	658,476	852	52,824	7,789	155,780
Stafford.....	6,115	317,980	1,055	65,410	3,976	79,520
Stanton.....	923	47,996	124	7,688	811	16,220
Stevens.....	876	45,552	141	8,742	803	16,060
Sumner.....	24,299	1,263,548	2,738	169,756	12,700	254,000
Thomas.....	4,417	229,684	424	26,288	2,789	55,780
Trego.....	2,779	144,508	180	11,160	1,553	31,060
Wabaunsee.....	11,130	578,760	652	40,424	9,688	193,760
Wallace.....	2,059	107,068	194	12,028	1,179	23,580
Washington.....	14,945	777,140	1,028	63,736	12,351	247,020
Wichita.....	1,209	62,868	101	6,262	475	9,500
Wilson.....	7,771	404,092	1,207	74,834	5,565	111,300
Woodson.....	6,458	335,816	648	40,176	4,522	90,440
Wyandotte.....	2,649	137,748	446	27,652	1,904	38,080
Totals.....	860,186	\$44,729,672	84,245	\$5,223,190	567,353	\$11,347,060

LIVE-STOCK STATISTICS, 1893—CONTINUED.

COUNTIES.	OTHER CATTLE.		SHEEP.		SWINE.	
	Number.	Value.	Number.	Value.	Number.	Value.
Allen	12,956	\$220,252	451	\$1,127 50	12,642	\$94,815 00
Anderson	15,087	256,479	782	1,955 00	15,737	118,027 50
Atchison	10,984	186,728	4,337	10,842 50	14,773	110,797 50
Barber	21,698	368,866	991	2,477 50	4,945	37,087 50
Barton	11,143	189,431	901	2,252 50	6,640	49,800 00
Bourbon	14,779	251,243	480	1,200 00	13,698	102,735 00
Brown	16,636	282,812	575	1,437 50	28,484	213,630 00
Butler	38,492	654,364	37,294	93,235 00	31,290	234,675 00
Chase	26,920	457,640	346	865 00	10,544	79,080 00
Chautauqua	14,317	243,389	52	130 00	9,252	69,390 00
Cherokee	10,273	174,641	748	1,870 00	8,935	67,012 50
Cheyenne	4,961	84,337	79	97 50	5,844	43,830 00
Clark	10,257	174,369	4	10 00	634	4,754 00
Clay	21,944	373,048	158	395 00	30,683	230,122 50
Cloud	20,039	340,663	8,355	20,887 50	29,240	219,300 00
Coffey	19,662	334,254	4,223	10,557 50	17,315	129,862 50
Comanche	7,203	122,451	2,934	7,335 00	808	6,060 00
Cowley	38,033	646,561	3,117	7,792 50	35,281	264,607 50
Crawford	11,454	194,718	878	2,195 00	13,362	100,215 00
Decatur	7,103	120,751	11	27 50	12,017	90,127 50
Dickinson	29,706	505,002	6,663	16,657 50	24,948	187,110 00
Doniphan	8,399	142,783	305	762 50	16,589	124,417 50
Douglas	17,731	301,427	1,738	4,345 00	21,540	161,550 00
Edwards	7,304	124,168	5,018	12,545 00	1,392	10,440 00
Elk	20,716	352,172	928	2,320 00	17,031	127,732 50
Ellis	7,135	121,295	38	95 00	1,474	11,055 00
Ellsworth	15,406	261,902	2,356	5,890 00	4,619	34,642 50
Finnney	4,464	75,888	5,677	14,192 50	724	5,430 00
Ford	6,320	107,440	680	1,700 00	1,561	11,707 50
Franklin	18,262	310,454	725	1,812 50	19,908	149,310 00
Geary	13,208	224,536	580	1,450 00	8,623	64,672 50
Gove	6,459	109,803	1,146	2,865 00	470	3,525 00
Graham	6,832	116,144	2,577	6,442 50	5,754	43,155 00
Grant	2,513	42,721	24	60 00	574	4,305 00
Gray	3,220	54,740	.....	.....	420	3,150 00
Greeley	1,055	17,935	2,302	5,755 00	418	3,135 00
Greenwood	44,110	749,870	5,122	12,805 00	21,749	163,117 50
Hamilton	5,001	85,017	245	612 50	692	5,190 00
Harper	13,389	227,613	92	230 00	9,830	73,725 00
Harvey	14,952	254,184	3,215	8,037 50	18,860	141,450 00
Haskell	1,053	17,901	22	55 00	371	2,782 50
Hodgeman	7,100	120,700	5,288	13,220 00	672	5,040 00
Jackson	16,926	287,742	42	105 00	22,187	166,402 50
Jefferson	19,854	337,518	1,275	3,187 50	24,743	185,572 50
Jewell	27,566	468,622	29	72 50	48,915	366,862 50
Johnson	12,082	205,394	1,663	4,157 50	19,940	149,550 00
Kearny	2,575	43,775	2,011	5,027 50	485	3,637 50
Kingman	17,023	289,391	3	7 50	12,773	95,797 50
Kiowa	5,968	101,456	16	40 00	1,097	8,227 50
Labette	11,608	197,336	1,101	2,752 50	11,013	82,597 50
Lane	2,587	43,979	300	750 00	490	3,675 00
Leavenworth	12,102	205,734	1,212	3,030 00	14,609	109,567 50
Lincoln	20,310	345,270	10	25 00	8,121	60,907 50
Linn	15,629	265,693	886	2,215 00	15,007	112,552 50
Logan	3,247	55,199	2,845	7,112 50	886	6,645 00
Lyon	31,470	534,990	2,377	5,942 50	15,392	115,440 00
Marion	28,903	491,351	7,498	18,745 00	20,132	150,990 00
Marshall	31,890	542,130	631	1,577 50	40,619	304,642 50
McPherson	22,687	385,679	503	1,257 50	25,856	193,920 00
Meade	10,653	181,101	2,184	5,460 00	862	6,465 00
Miami	20,504	348,568	2,383	5,957 50	22,272	167,040 00
Mitchell	19,133	325,261	5,052	12,630 00	20,810	156,075 00
Montgomery	12,296	209,032	796	1,990 00	14,160	106,200 00
Morris	26,584	451,928	1,440	3,600 00	13,932	104,490 00
Morton	2,692	45,764	6	15 00	344	2,580 00
Nemaha	24,877	422,909	810	2,025 00	43,707	327,802 50
Neosho	11,855	201,535	85	212 50	14,545	109,087 50
Ness	4,540	77,180	284	710 00	1,327	9,952 50
Norton	11,875	201,875	7,804	19,510 00	19,746	148,095 00
Osage	28,806	489,702	2,254	5,635 00	24,547	184,102 50
Osborne	18,172	308,924	1,704	4,260 00	15,154	113,655 00
Ottawa	32,245	548,165	830	2,075 00	14,388	107,910 00
Pawnee	5,828	99,076	1,184	2,960 00	1,487	11,152 50
Phillips	14,104	239,768	1,645	4,112 50	25,241	189,307 50
Pottawatomie	32,958	560,286	991	2,477 50	30,738	230,535 00
Pratt	4,026	68,442	50	125 00	4,554	34,155 00
Rawlins	5,512	93,704	853	2,132 50	10,740	80,550 00

LIVE-STOCK STATISTICS, 1893—CONCLUDED.

COUNTIES.	OTHER CATTLE.		SHEEP.		SWINE.	
	Number.	Value.	Number.	Value.	Number.	Value.
Reno.....	30,314	\$515,338	574	\$1,435 00	34,614	\$259,605 00
Republic.....	20,616	350,472	382	955 00	46,250	346,875 00
Rice.....	14,516	246,772	614	1,535 00	14,013	105,097 50
Riley.....	21,873	371,841	447	1,117 50	23,143	173,572 50
Rooks.....	7,996	135,932	1,146	2,865 00	6,353	47,647 50
Rush.....	4,734	80,478	354	885 00	1,548	11,610 00
Russell.....	14,291	242,947	2,422	6,055 00	4,457	33,427 50
Saline.....	17,540	298,180	1,512	3,780 00	143	1,072 50
Scott.....	1,773	30,141	5,364	13,410 00	398	2,985 00
Sedgwick.....	27,664	470,288	8,185	20,462 50	38,484	288,680 00
Seward.....	3,787	64,379	.....	.....	387	2,902 50
Shawnee.....	16,271	276,607	200	500 00	18,790	140,925 00
Sheridan.....	6,217	105,689	4,675	11,687 50	2,777	20,827 50
Sherman.....	3,830	65,110	1,688	420 00	2,587	19,402 50
Smith.....	17,429	296,293	1,035	2,587 50	36,872	276,544 00
Stafford.....	9,731	165,427	1,164	2,910 00	8,121	60,907 50
Stanton.....	1,398	23,766	350	875 00	662	4,965 00
Stevens.....	1,914	32,538	20	50 00	563	4,222 50
Sumner.....	29,796	506,532	2,690	6,725 00	34,467	258,502 50
Thomas.....	4,749	80,733	215	537 50	3,124	23,430 00
Trego.....	7,034	119,578	7,776	19,440 00	685	5,137 50
Wabaunsee.....	24,023	408,391	558	1,395 00	18,064	135,480 00
Wallace.....	2,803	47,651	7,079	17,697 50	622	4,665 00
Washington.....	27,823	472,991	1,513	3,782 50	40,123	300,922 50
Wichita.....	1,090	18,530	806	2,015 00	420	3,150 00
Wilson.....	13,845	235,365	466	1,165 00	14,151	106,132 50
Woodson.....	12,540	213,180	10,460	26,150 00	7,588	56,910 00
Wyandotte.....	2,313	39,321	563	1,407 50	5,518	41,385 00
Totals.....	1,505,273	\$25,589,641	224,952	\$562,380 00	1,406,086	\$10,545,645 00

LIVE-STOCK STATISTICS, 1894.

TABLE showing number and value of various kinds of live stock for 1894.

COUNTIES.	HORSES.		MULES AND ASSES.		MILCH COWS.	
	Number.	Value.	Number.	Value.	Number.	Value.
Allen.....	8,896	\$293,568	1,025	\$43,050	5,799	\$127,578
Anderson.....	9,210	303,930	1,487	62,454	5,947	130,834
Atchison.....	7,794	257,202	1,295	54,390	5,267	115,874
Barber.....	5,800	191,400	988	41,496	2,469	54,318
Barton.....	10,159	335,247	1,173	49,266	5,430	119,460
Bourbon.....	11,130	367,290	1,384	58,128	7,024	154,528
Brown.....	13,323	439,659	1,576	66,192	7,419	163,218
Butler.....	17,039	562,287	1,700	71,400	10,513	231,286
Chase.....	6,087	200,871	558	23,436	2,497	54,934
Chautauqua.....	7,472	246,576	1,347	56,574	5,291	116,402
Cherokee.....	8,568	282,744	1,302	54,684	5,576	122,672
Cheyenne.....	5,134	169,422	379	15,918	2,454	53,988
Clark.....	1,936	63,888	185	7,770	840	18,480
Clay.....	13,098	432,234	830	34,860	7,226	158,972
Cloud.....	14,480	477,840	900	37,800	8,170	179,740
Coffey.....	12,188	402,204	1,383	58,086	7,232	159,104
Comanche.....	1,810	59,730	201	8,442	865	19,030
Cowley.....	18,881	623,073	1,772	74,424	10,969	241,318
Crawford.....	10,340	341,220	1,527	64,134	5,613	123,486
Decatur.....	6,589	217,437	531	22,302	3,488	76,736
Dickinson.....	15,235	502,755	904	37,968	12,505	275,110
Doniphan.....	6,173	203,709	1,577	66,234	3,838	84,436
Douglas.....	11,088	365,904	804	33,768	6,635	145,970
Edwards.....	3,531	116,523	347	14,574	2,353	51,766
Elk.....	9,290	306,570	1,531	64,302	5,694	125,268
Ellis.....	5,800	191,400	470	19,740	2,423	53,306
Ellsworth.....	5,938	195,954	572	24,024	3,392	74,624
Finney.....	3,106	102,498	195	8,190	1,690	37,180
Ford.....	3,470	114,510	266	11,172	2,606	57,332
Franklin.....	11,395	376,035	985	41,370	7,484	164,648
Geary.....	5,474	180,642	267	11,214	3,533	77,726

LIVE-STOCK STATISTICS, 1894—CONTINUED.

COUNTIES.	HORSES.		MULES AND ASSES.		MILCH COWS.	
	Number.	Value.	Number.	Value.	Number.	Value.
Gove.....	2,569	\$84,777	159	\$6,678	1,324	\$29,128
Graham.....	3,772	124,476	200	8,400	2,452	53,944
Grant.....	940	31,020	57	2,394	513	11,286
Gray.....	1,448	47,784	189	7,938	968	21,296
Greeley.....	998	32,934	102	4,284	579	12,738
Greenwood.....	12,260	404,877	2,084	87,528	7,727	169,994
Hamilton.....	1,491	49,203	89	3,738	1,054	23,188
Harper.....	8,007	264,231	1,172	49,224	3,814	83,908
Harvey.....	10,363	341,979	842	35,364	7,611	167,442
Haskell.....	835	27,555	103	4,326	385	8,470
Hodgeman.....	2,606	85,998	97	4,074	1,656	36,432
Jackson.....	12,148	400,884	1,410	59,220	8,020	176,550
Jefferson.....	10,536	347,688	1,559	65,478	7,212	158,664
Jewell.....	16,980	560,340	1,403	58,926	9,659	212,498
Johnson.....	11,271	371,943	1,167	49,014	6,291	138,402
Kearny.....	1,151	37,983	134	5,628	577	12,694
Kingman.....	7,584	250,272	1,071	44,982	4,364	96,008
Kiowa.....	2,546	84,018	415	17,430	1,378	30,316
Labette.....	11,810	389,730	1,221	51,282	6,707	147,554
Lane.....	2,234	73,722	171	7,182	985	21,670
Leavenworth.....	10,188	336,204	1,680	70,560	7,054	155,188
Lincoln.....	8,111	267,663	600	25,200	4,712	103,664
Linn.....	9,773	322,509	1,866	78,372	7,327	161,194
Logan.....	3,199	105,567	291	12,222	1,201	26,422
Lyon.....	13,222	436,326	1,197	50,274	9,106	200,332
Marion.....	12,742	420,486	622	26,124	8,789	193,358
Marshall.....	16,441	542,553	1,508	63,336	10,968	241,296
McPherson.....	16,435	542,355	967	40,614	9,226	202,972
Meade.....	2,339	77,187	167	7,014	1,154	25,388
Miami.....	11,832	390,456	1,216	51,072	6,745	148,390
Mitchell.....	12,222	403,326	847	35,574	6,702	147,444
Montgomery.....	9,438	311,454	1,638	68,796	6,544	143,968
Morris.....	8,082	266,706	505	21,210	4,782	105,204
Morton.....	1,015	33,495	57	2,394	269	5,918
Nemaha.....	14,701	485,133	1,415	59,430	9,011	198,242
Neosho.....	11,130	367,290	1,492	62,664	7,090	155,980
Ness.....	5,691	187,803	524	22,008	2,476	54,472
Norton.....	12,030	396,990	973	40,866	6,200	136,400
Osage.....	14,387	474,771	1,055	44,310	9,974	219,428
Osborne.....	11,325	373,725	618	25,956	6,436	141,592
Ottawa.....	9,864	325,512	853	35,826	5,779	127,138
Pawnee.....	5,465	180,345	451	18,942	2,430	53,460
Phillips.....	10,787	355,971	897	35,154	6,349	139,678
Pottawatomie.....	14,563	480,579	779	32,718	9,881	217,382
Pratt.....	4,842	159,786	946	39,732	2,296	50,512
Rawlins.....	6,046	199,518	400	16,800	2,868	63,096
Reno.....	14,619	482,427	2,047	85,974	9,758	214,676
Republic.....	13,448	443,784	1,145	48,090	8,077	177,694
Rice.....	11,920	393,360	1,385	58,170	6,716	147,752
Riley.....	8,232	271,656	353	14,826	6,406	140,932
Rooks.....	7,035	232,155	503	21,126	3,731	82,082
Rush.....	5,418	178,794	335	14,070	2,468	54,296
Russell.....	7,365	243,045	479	20,118	4,079	89,738
Saline.....	10,342	341,286	670	28,140	5,834	128,348
Scott.....	1,557	51,381	83	3,487	638	14,036
Sedgwick.....	16,729	552,057	1,485	62,370	10,049	221,078
Seward.....	579	19,107	51	2,142	327	7,194
Shawnee.....	13,858	457,314	1,005	42,210	8,110	178,420
Sheridan.....	3,409	112,497	219	9,198	1,747	38,434
Sherman.....	4,187	138,171	314	13,188	2,391	52,602
Smith.....	12,701	419,133	858	36,036	7,526	165,572
Stafford.....	7,262	239,646	1,328	55,776	4,170	91,740
Stanton.....	794	26,202	69	2,898	513	11,286
Stevens.....	582	19,202	137	5,754	650	14,300
Sumner.....	20,707	683,331	2,428	101,976	10,250	225,500
Thomas.....	4,460	147,180	404	16,968	2,262	49,764
Trego.....	2,921	96,393	154	6,468	1,419	31,218
Wabaunsee.....	10,290	339,570	697	29,274	9,700	213,400
Wallace.....	2,639	87,087	175	7,359	1,096	24,112
Washington.....	15,088	497,904	1,071	44,982	11,469	252,318
Wichita.....	1,745	57,585	115	4,830	703	15,466
Wilson.....	9,133	301,389	1,515	63,630	6,251	137,522
Woodson.....	6,816	224,928	620	26,040	4,796	105,512
Wyandotte.....	2,953	97,449	474	19,908	2,099	46,178
Totals.....	864,651	\$28,533,483	86,729	\$3,642,618	524,127	\$11,530,794

LIVE-STOCK STATISTICS, 1894 — CONTINUED.

COUNTIES.	OTHER CATTLE.		SHEEP.		SWINE.	
	Number.	Value.	Number.	Value.	Number.	Value.
Allen.....	11,287	\$203,166	263	\$657 50	15,975	\$111,825
Anderson.....	15,155	272,790	990	2,475 00	23,994	167,958
Atchison.....	11,152	200,736	405	1,012 50	21,913	153,391
Barber.....	12,428	223,704	1,308	3,270 00	3,968	27,776
Barton.....	8,008	144,144	722	1,865 00	7,367	51,569
Bourbon.....	13,307	239,526	272	680 00	18,973	132,811
Brown.....	15,138	272,484	1,400	3,500 00	34,249	239,743
Butler.....	40,686	732,348	28,330	70,825 00	37,307	261,149
Chase.....	23,454	422,172	299	747 50	12,302	86,114
Chautauqua.....	13,956	251,208	28	70 00	12,065	84,455
Cherokee.....	7,621	137,178	749	1,872 50	9,144	64,008
Cheyenne.....	3,949	71,082	109	272 50	5,990	41,510
Clark.....	6,791	122,238	110	275 00	519	3,633
Clay.....	17,641	317,538	252	630 00	34,618	242,326
Cloud.....	14,769	265,842	377	942 50	25,958	181,706
Coffey.....	22,017	396,306	3,134	7,835 00	22,401	156,807
Comanche.....	4,330	77,940	1,501	3,752 50	639	4,473
Cowley.....	29,173	525,114	3,036	7,590 00	29,848	208,936
Crawford.....	9,142	164,556	1,521	3,802 50	15,123	105,861
Decatur.....	6,199	111,582	15	37 50	14,214	99,498
Dickinson.....	27,050	486,900	6,240	15,600 00	31,423	219,961
Doniphan.....	8,774	157,932	345	862 50	26,625	186,375
Douglas.....	16,428	295,704	1,801	4,502 50	29,200	204,400
Edwards.....	4,615	83,070	388	970 00	1,483	10,381
Elk.....	18,307	329,526	26	65 00	18,259	127,813
Ellis.....	5,928	106,704	256	640 00	2,459	17,213
Ellsworth.....	11,114	200,052	104	260 00	4,305	30,135
Finney.....	4,433	79,794	3,923	9,807 50	917	6,419
Ford.....	4,610	82,980	237	592 50	1,365	9,555
Franklin.....	20,269	364,842	989	2,472 50	25,393	177,751
Geary.....	13,783	248,094	587	1,467 50	11,742	82,194
Gove.....	6,201	111,618	1,169	2,922 50	476	3,332
Graham.....	5,203	93,654	1,336	3,340 00	3,800	26,600
Grant.....	1,383	24,894	41	102 50	222	1,554
Gray.....	1,769	31,842	25	62 50	375	2,625
Greeley.....	774	13,932	920	2,300 00	201	1,407
Greenwood.....	40,931	736,758	1,235	3,087 50	31,457	220,199
Hamilton.....	3,767	67,806	1,400	3,500 00	530	3,710
Harper.....	7,016	126,288	29	72 50	6,586	46,102
Harvey.....	12,242	220,356	2,046	5,115 00	17,379	121,653
Haskell.....	579	10,422	.....	.....	231	1,617
Hodgeman.....	4,136	74,448	7,863	19,657 50	458	3,206
Jackson.....	17,888	321,984	90	225 00	31,417	219,919
Jefferson.....	18,673	336,114	903	2,257 50	32,761	229,327
Jewell.....	19,992	359,856	4	10 00	49,621	347,347
Johnson.....	11,496	206,928	8,482	21,205 00	14,289	100,023
Kearny.....	1,532	27,576	1,475	3,687 50	533	3,731
Kingman.....	11,248	202,464	755	1,887 50	9,781	68,467
Kiowa.....	3,267	58,806	6	15 00	949	6,643
Labette.....	8,614	155,052	2,123	5,307 50	14,282	99,974
Lane.....	2,293	41,274	301	752 50	444	3,108
Leavenworth.....	11,540	207,720	1,298	3,245 00	18,358	128,506
Lincoln.....	14,448	260,064	8	20 00	8,782	61,474
Linn.....	14,384	258,912	362	905 00	20,309	142,163
Logan.....	1,963	35,334	3,479	8,697 50	657	4,599
Lyon.....	37,136	668,448	904	2,260 00	28,122	196,854
Marion.....	23,102	415,836	2,441	6,102 50	21,332	149,324
Marshall.....	25,990	467,820	620	1,550 00	41,715	292,005
McPherson.....	19,075	343,350	629	1,572 50	24,748	173,236
Meade.....	6,305	113,490	3,152	7,880 00	765	5,355
Miami.....	19,120	344,160	2,830	7,075 00	32,225	225,575
Mitchell.....	16,331	293,958	2,232	5,580 00	21,924	153,468
Montgomery.....	11,387	204,966	693	1,732 50	19,940	139,580
Morris.....	24,790	446,220	1,598	3,995 00	16,736	117,152
Morton.....	2,629	47,322	3	7 50	297	2,079
Nemaha.....	23,810	428,580	738	1,845 00	50,374	352,618
Neosho.....	11,154	200,772	104	260 00	17,405	121,835
Ness.....	4,522	81,396	.....	.....	1,086	7,602
Norton.....	12,825	230,850	669	1,647 50	26,174	183,218
Osage.....	34,190	615,420	3,953	9,882 50	35,871	251,097
Osborne.....	14,880	267,840	949	2,372 50	21,332	149,324
Ottawa.....	23,802	428,436	854	2,135 00	13,750	96,250
Pawnee.....	3,789	68,202	402	1,005 00	1,681	11,767
Phillips.....	13,572	244,296	694	1,735 00	24,695	172,865
Pottawatomie.....	31,145	560,610	3,032	7,580 00	37,924	265,468
Pratt.....	1,892	34,056	122	305 00	3,577	25,039
Rawlins.....	3,619	65,142	470	1,175 00	13,404	93,828

LIVE-STOCK STATISTICS, 1894 — CONCLUDED.

COUNTIES.	OTHER CATTLE.		SHEEP.		SWINE.	
	Number.	Value.	Number.	Value.	Number.	Value.
Reno.....	22,182	\$399,276	1,839	\$4,597 50	33,078	\$231,546
Republic.....	14,362	258,516	63	157 50	37,278	260,946
Rice.....	11,009	198,162	871	2,167 50	16,610	116,270
Riley.....	20,771	373,878	406	1,015 00	26,104	182,728
Rooks.....	6,973	125,514	756	1,890 00	8,226	57,582
Rush.....	3,852	69,336	903	2,257 50	1,865	13,055
Russell.....	11,184	201,312	3,128	7,820 00	6,078	42,546
Saline.....	14,572	262,296	957	2,392 50	12,396	86,772
Scott.....	941	16,938	3,629	9,072 50	345	2,415
Sedgwick.....	20,041	360,738	4,911	12,277 50	37,205	260,435
Seward.....	2,788	50,184	.....	.....	394	2,758
Shawnee.....	16,193	291,474	4,120	10,300 00	22,995	160,965
Sheridan.....	4,007	72,126	3,827	9,567 50	2,640	18,480
Sherman.....	3,008	54,144	171	427 50	2,750	19,250
Smith.....	13,953	251,154	1,953	4,882 50	37,768	264,376
Stafford.....	8,688	156,384	1,132	2,830 00	12,708	88,956
Stanton.....	1,149	20,682	.....	.....	380	2,660
Stevens.....	1,015	18,270	386	965 00	246	1,722
Sumner.....	18,756	337,608	1,266	3,165 00	28,207	197,449
Thomas.....	3,275	58,950	58	145 00	2,186	15,302
Trego.....	5,078	91,404	1,901	4,752 50	1,028	7,196
Wabunsee.....	24,709	444,762	79	197 50	25,331	177,317
Wallace.....	2,536	45,648	703	1,757 50	573	4,901
Washington.....	23,295	419,310	1,109	2,772 50	52,280	365,569
Wichita.....	888	15,984	38	95 00	367	2,601
Wilson.....	14,238	256,284	494	1,235 00	20,943	146,601
Woodson.....	11,675	210,150	9,238	23,095 00	8,848	61,936
Wyandotte.....	2,737	49,226	300	750 00	5,893	41,251
Totals.....	1,291,973	\$23,252,274	166,384	\$415,960 00	1,623,375	\$11,363,625

SHEEP KILLED BY DOGS AND WOLVES; NUMBER OF DOGS.

TABLE showing the number of sheep killed by dogs and wolves respectively for the year 1894, and number of dogs for the years 1893 and 1894.

COUNTIES.	1894.		NUMBER OF DOGS.	
	Killed by dogs.	Killed by wolves.	1893.	1894.
Allen.....	.....	5	1,452	1,040
Anderson.....	35	.....	1,517	1,707
Atchison.....	.....	2	2,567	2,428
Barber.....	.....	51	1,458	961
Barton.....	.....	10	2,147	2,125
Bourbon.....	5	4	2,532	2,673
Brown.....	10	5	1,664	1,634
Butler.....	16	159	3,039	2,641
Chase.....	2	2	1,126	908
Chautauqua.....	2	.....	2,024	1,840
Cherokee.....	41	5	2,186	2,008
Cheyenne.....	6	.....	958	871
Clark.....	.....	.....	335	290
Clay.....	.....	.....	1,975	2,034
Cloud.....	.....	28	2,181	2,432
Coffey.....	.....	7	2,105	2,066
Comanche.....	.....	20	362	281
Cowley.....	2	22	4,047	3,346
Crawford.....	8	5	2,050	1,719
Decatur.....	4	.....	999	1,153
Dickinson.....	18	.....	2,151	2,028
Doniphan.....	3	.....	1,708	1,639
Douglas.....	21	9	2,677	1,842
Edwards.....	.....	39	607	591
Elk.....	.....	1	1,795	1,533
Ellis.....	2	13	1,004	1,105
Ellsworth.....	.....	.....	1,313	1,100
Finney.....	1	75	270	389
Ford.....	.....	11	708	645
Franklin.....	11	73	1,983	1,925
Geary.....	.....	.....	1,035	1,248

SHEEP KILLED BY DOGS AND WOLVES; NUMBER OF DOGS—CONCLUDED.

COUNTIES.	1894.		NUMBER OF DOGS.	
	Killed by dogs.	Killed by wolves.	1893.	1894.
Gove.....	1	12	278	359
Graham.....		39	770	825
Grant.....			210	146
Gray.....			328	285
Greeley.....			156	177
Greenwood.....	2	22	1,959	1,958
Hamilton.....		20	240	239
Harper.....	1	1	1,505	1,276
Harvey.....	1	38	2,023	1,877
Haskell.....			197	116
Hodgeman.....		100	541	538
Jackson.....			1,273	1,356
Jefferson.....		18	2,007	2,281
Jewell.....			2,555	2,737
Johnson.....	145	36	1,704	1,805
Kearny.....		31	208	186
Kingman.....		3	1,694	1,556
Kiowa.....		2	279	345
Labette.....	15	20	2,606	2,418
Lane.....		25	322	206
Leavenworth.....	4	10	3,074	2,738
Lincoln.....			1,521	1,523
Linn.....	8	3	1,715	1,915
Logan.....			346	339
Lyon.....	27	3	2,173	2,298
Marion.....	9	3	2,639	2,491
Marshall.....	11		2,929	3,191
McPherson.....	3	16	2,568	2,756
Meade.....			370	335
Miami.....			1,956	1,800
Mitchell.....		20	1,754	1,909
Montgomery.....	2	26	2,702	2,008
Morris.....			1,381	1,345
Morton.....			116	100
Nemaha.....	10	2	2,152	1,973
Neosho.....	1		2,307	2,066
Ness.....			659	629
Norton.....	1	30	1,335	1,829
Osage.....	5	60	3,110	2,956
Osborne.....		12	1,644	1,792
Ottawa.....			1,740	1,602
Pawnee.....		5	640	636
Phillips.....			2,023	1,984
Pottawatomie.....			2,195	2,072
Pratt.....	7		1,011	941
Rawlins.....	7	15	1,050	1,087
Reno.....	5	3	2,775	2,561
Republic.....			2,542	2,301
Rice.....	36		1,723	1,733
Riley.....	1	2	1,636	1,324
Rooks.....	5	4	1,211	1,199
Rush.....	1		867	994
Russell.....		20	1,308	1,315
Saline.....		5	1,364	1,554
Scott.....	1		129	170
Sedgwick.....	3	10	2,789	2,764
Seward.....			134	78
Shawnee.....	4		3,181	1,948
Sheridan.....	1	9	571	507
Sherman.....			741	584
Smith.....		5	2,332	2,183
Stafford.....	140	6	1,181	1,362
Stanton.....	1	5	151	158
Stevens.....			149	100
Sumner.....		54	3,622	3,311
Thomas.....			741	673
Trego.....	8		413	392
Wabaunsee.....	2	30	2,172	1,982
Wallace.....		1	325	308
Washington.....	5	11	2,838	3,051
Wichita.....			155	210
Wilson.....			1,666	1,887
Woodson.....	13	22	1,298	1,174
Wyandotte.....			990	986
Totals.....	666	1,305	156,944	150,012

PRODUCTS OF LIVE STOCK.

TABLE showing values of various products of live stock for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Animals fattened and slaughtered or sold for slaughter.	Milk sold other than that sold for butter and cheese.	Poultry and eggs sold.	Animals fattened and slaughtered or sold for slaughter.	Milk sold other than that sold for butter and cheese.	Poultry and eggs sold.
Allen.....	\$314,154	\$810	\$36,446	\$371,028	\$130	\$50,894
Anderson.....	695,699	5,408	27,977	559,865	7,166	33,137
Atchison.....	539,596	22,815	22,862	444,010	13,388	23,358
Barber.....	271,396	1,095	11,095	218,547	720	9,944
Barton.....	169,318	6,084	50,327	148,650	2,030	47,305
Bourbon.....	1,083,750	29,790	38,066	388,051	23,345	36,528
Brown.....	935,716	3,917	39,225	770,980	1,738	44,281
Butler.....	1,085,375	5,116	77,246	1,143,302	6,428	76,989
Chase.....	867,358	276	12,487	798,017	366	17,730
Chautauqua.....	289,930	10	22,510	323,387	.....	21,991
Cherokee.....	161,346	13,318	23,801	152,873	2,693	74,303
Cheyenne.....	99,197	96	10,376	127,220	18	12,266
Clark.....	68,564	430	2,941	110,770	56	2,413
Clay.....	724,673	7,212	45,451	745,990	7,046	46,964
Cloud.....	687,572	1,959	62,431	604,461	4,978	64,877
Coffey.....	698,379	1,570	40,093	638,230	2,358	46,299
Comanche.....	42,153	331	4,014	62,659	55	2,770
Cowley.....	885,830	16,890	99,769	830,118	11,510	81,163
Crawford.....	293,421	10,229	33,302	234,794	6,330	40,180
Decatur.....	130,359	952	16,543	196,523	2,225	19,419
Dickinson.....	677,642	25,785	72,164	576,732	32,929	67,112
Doniphan.....	378,889	1,967	19,963	400,183	751	25,223
Douglas.....	545,845	7,366	38,166	643,811	9,408	37,976
Edwards.....	40,560	1,495	9,429	61,689	1,627	9,189
Elk.....	594,815	457	34,407	638,731	718	33,703
Ellis.....	46,924	20	10,158	103,602	56	11,172
Ellsworth.....	273,353	330	43,320	317,642	1,231	30,974
Finney.....	55,532	800	7,617	77,042	400	6,644
Ford.....	64,644	2,600	13,380	47,850	1,524	11,056
Franklin.....	676,934	6,335	38,429	717,513	5,465	49,656
Geary.....	297,094	5,040	17,704	346,858	4,660	37,219
Gove.....	26,835	18	6,310	21,518	51	4,896
Graham.....	99,705	194	13,414	156,006	110	11,139
Grant.....	15,274	45	2,918	8,796	25	1,126
Gray.....	11,888	125	4,545	15,193	20	3,131
Greeley.....	7,430	78	3,339	7,149	92	1,944
Greenwood.....	1,287,224	684	37,561	1,448,187	1,055	41,420
Hamilton.....	49,250	448	3,492	36,182	3,837	3,049
Harper.....	383,005	2,111	24,167	225,198	2,150	17,804
Harvey.....	399,495	8,371	50,745	402,688	6,829	40,590
Haskell.....	7,198	190	2,419	7,087	6	1,805
Hodgeman.....	27,507	.....	6,873	45,182	230	6,276
Jackson.....	759,977	4,338	43,380	650,380	11,066	48,582
Jefferson.....	766,803	660	50,542	765,308	15,401	54,842
Jewell.....	1,179,383	60	99,539	1,198,781	1,811	99,379
Johnson.....	484,001	30,570	37,058	593,363	43,840	49,648
Kearny.....	19,477	61	3,552	12,141	15	2,449
Kingman.....	377,099	1,709	17,695	281,447	1,236	16,613
Kiowa.....	73,717	35	5,675	67,552	261	4,923
Labette.....	278,213	1,209	40,165	408,773	561	39,727
Lane.....	119,469	1,207	3,461	16,046	664	2,382
Leavenworth.....	440,406	27,117	32,104	421,441	17,414	40,613
Lincoln.....	417,561	3,016	50,288	362,477	20	50,071
Linn.....	467,375	182	37,747	506,582	252	48,294
Logan.....	26,872	50	4,718	35,723	190	4,771
Lyon.....	936,851	14,744	46,745	210,710	13,872	58,579
Marion.....	837,243	10,339	69,549	839,460	14,012	80,996
Marshall.....	793,440	96	11,912	1,036,675	572	83,202
McPherson.....	679,244	3,145	106,190	651,008	6,417	68,201
Meade.....	39,920	.....	2,552	37,231	125	2,537
Miami.....	716,150	1,075	43,140	837,977	7,171	86,552
Mitchell.....	446,367	2,170	83,493	496,657	226	83,584
Montgomery.....	288,080	847	39,740	314,913	3,675	52,756
Morris.....	781,692	1,454	33,673	787,489	1,875	28,845
Morton.....	31,170	10	74,913	19,458	10	5,390
Nemaha.....	1,165,804	2,077	58,417	1,057,334	10,326	62,051
Neosho.....	315,724	3,253	46,783	333,866	1,938	59,080
Ness.....	36,658	689	11,187	65,656	.....	20,138
Norton.....	304,009	137	27,456	601,074	850	53,602
Osage.....	1,058,750	2,233	51,743	1,310,033	9,890	57,168
Osborne.....	377,857	1,993	58,709	497,775	1,140	74,811
Ottawa.....	889,037	695	31,159	910,650	2,172	31,228

PRODUCTS OF LIVE STOCK—CONTINUED.

COUNTIES.	1893.			1894.		
	Animals fattened and slaughtered or sold for slaughter.	Milk sold other than that sold for butter and cheese.	Poultry and eggs sold.	Animals fattened and slaughtered or sold for slaughter.	Milk sold other than that sold for butter and cheese.	Poultry and eggs sold.
Pawnee	\$66,177	\$888	\$13,604	\$50,647	\$163	\$10,888
Phillips	375,458	743	54,176	459,411	2,495	51,027
Pottawatomie	1,217,625	2,557	39,548	1,198,305	3,553	49,767
Pratt	114,316	72	13,627	160,457	609	11,727
Rawlins	119,404	700	13,718	203,229	566	16,300
Reno	884,679	9,664	56,994	767,617	3,038	54,423
Republic	892,209	1,548	84,513	715,194	2,339	85,332
Rice	362,949	1,426	45,687	322,854	1,934	48,597
Riley	832,756	2,863	37,520	724,378	2,206	38,408
Rooks	136,284	251	25,270	170,541	37	28,828
Rush	39,538	264	20,286	39,804	142	20,176
Russell	204,310	2,652	30,990	241,434	1,007	27,723
Saline	372,507	7,108	43,814	360,507	2,147	44,738
Scott	22,526	233	1,952	13,909	16	1,587
Sedgwick	825,109	26,140	63,392	793,845	31,691	65,240
Seward	18,585	34	1,560	20,007	92	791
Shawnee	575,749	24,359	37,501	508,412	26,712	38,731
Sheridan	63,597	.....	13,641	90,337	.....	14,608
Sherman	46,517	3,300	16,224	58,588	2,102	13,540
Smith	577,199	1,489	73,879	743,916	315	69,495
Stafford	258,319	303	71,563	229,403	.....	21,110
Stanton	11,255	100	3,666	3,852	35	51,759
Stevens	7,631	.....	1,166	4,948	15	1,126
Sumner	1,042,697	5,307	94,645	741,179	4,786	80,251
Thomas	68,516	435	12,820	57,459	320	11,613
Trego	71,148	715	5,980	28,363	180	6,467
Wabaunsee	591,392	2,473	37,007	877,620	3,281	41,985
Wallace	144,618	115	3,409	96,138	233	3,088
Washington	1,017,699	9,240	69,957	985,024	2,413	77,874
Wichita	12,806	108	2,602	17,181	104	2,682
Wilson	428,915	500	40,592	583,015	460	45,226
Woodson	254,965	1,184	17,749	247,682	299	23,596
Wyandotte	98,128	16,161	12,478	52,176	19,990	8,169
Totals	\$42,874,761	\$430,865	\$3,421,296	\$42,069,703	\$446,036	\$3,643,801

PRODUCTS OF LIVE STOCK—CONTINUED.

COUNTIES.	WOOL CLIP, 1892.		CHEESE, 1893.		BUTTER, 1893.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Allen	1,424	\$227 84	5,560	\$611 60	292,758	\$46,841 28
Anderson	8,275	1,324 00	19,390	2,132 90	251,093	40,174 88
Atchison	2,930	468 80	4,750	522 50	259,416	41,506 56
Barber .....	.....	.....	50	5 50	153,942	24,630 72
Barton	700	112 00	965	106 15	222,101	35,536 16
Bourbon	2,350	376 00	3,000	330 00	445,099	71,215 84
Brown	3,599	575 84	1,090	119 90	372,882	59,661 12
Butler	229,334	36,693 44	4,740	521 40	585,305	93,648 80
Chase	2,625	420 00	.....	.....	224,218	35,874 88
Chautauqua	200	32 00	125	13 75	256,313	41,010 08
Cheerokee	29,963	4,794 08	5,300	583 00	361,969	57,915 04
Cheyenne	219	35 04	160	17 60	101,270	16,203 20
Clark .....	.....	.....	835	91 85	39,378	6,300 48
Clay	862	137 92	5,460	600 60	412,789	66,046 24
Cloud	4,250	680 00	22,820	2,510 20	485,084	77,613 44
Coffey	35,042	5,606 72	480	52 80	316,896	50,703 36
Comanche	13,250	2,120 00	555	61 05	52,709	8,433 44
Cowley	17,610	2,817 60	5,200	572 00	816,136	130,581 76
Crawford	3,932	629 12	5,000	550 00	326,755	52,280 80
Decatur	152	24 32	485	53 25	148,098	23,695 68
Dickinson	29,277	4,684 32	1,956	215 16	326,688	52,270 08
Doniphan	322	51 52	2,050	225 50	211,000	33,760 00
Douglas	9,287	1,485 92	600	66 00	418,047	66,887 52
Edwards	10,455	1,672 80	120	13 20	92,845	14,855 20
Elk	625	100 00	16,925	1,861 75	307,045	49,127 20
Ellis	131	20 96	311	34 21	84,852	13,576 32
Ellsworth	20,345	3,255 20	7,215	793 65	216,420	34,627 20
Finney	23,200	3,712 00	395	43 45	57,433	9,189 28
Ford	1,037	165 92	1,825	200 75	102,946	16,471 36
Franklin	2,402	384 32	.....	.....	401,776	64,284 16

PRODUCTS OF LIVE STOCK—CONTINUED.

COUNTIES.	WOOL CLIP, 1892.		CHEESE, 1893.		BUTTER, 1893.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Geary.....	4,945	\$791 20	1,500	\$165 00	165,794	\$26,527 04
Gove.....	1,965	314 40	1,785	196 35	66,154	10,585 12
Graham.....	13,940	2,230 40	5,015	551 65	143,308	22,929 28
Grant.....			220	24 20	18,349	2,935 84
Gray.....	1,815	199 65	1,815	199 65	49,425	7,908 00
Greeley.....	1,205	192 80	900	99 00	21,203	3,392 48
Greenwood.....	21,696	3,471 36	2,605	286 55	311,372	49,819 52
Hamilton.....	8,120	1,299 20	100	11 00	34,390	5,502 40
Harper.....	945	151 20	1,587	174 57	237,343	37,974 88
Harvey.....	18,463	2,954 08	11,288	1,241 68	326,354	52,216 64
Haskell.....					27,836	4,453 76
Hodgeman.....	31,541	5,046 56			66,958	10,713 28
Jackson.....	410	65 60	240	26 40	342,033	54,725 28
Jefferson.....	3,120	499 20	8,000	880 00	382,921	61,267 36
Jewell.....	200	32 00	3,820	420 20	558,533	89,365 28
Johnson.....	3,904	624 64	5,750	632 50	315,120	50,419 20
Kearny.....	5,233	837 28	1,030	113 30	33,820	5,411 20
Kingman.....	8,700	1,392 00	1,580	173 80	218,846	35,015 36
Kiowa.....	20	3 20	105	11 55	64,541	10,326 56
Labette.....	11,579	1,852 64	9,130	1,004 30	437,727	70,036 32
Lane.....	3,426	548 16	150	16 50	45,823	7,331 68
Leavenworth.....	6,320	1,011 20			364,231	58,276 96
Lincoln.....	10	1 60	410	45 10	255,974	40,955 84
Linn.....	2,880	460 80	900	99 00	329,088	52,654 08
Legan.....	11,630	1,860 80	1,595	175 45	59,744	9,559 04
Lyon.....	7,523	1,203 68	45,215	4,973 65	329,192	52,670 72
Marion.....	43,515	6,962 40	9,087	999 57	368,252	58,920 32
Marshall.....	650	104 00			407,108	65,137 28
McPherson.....	1,822	291 52	2,577	283 47	433,133	69,301 28
Meade.....	13,297	2,127 52	3,080	338 80	40,414	6,466 24
Miami.....	5,320	851 20	3,500	385 00	407,245	65,159 20
Mitchell.....	23,591	3,774 56	42	4 62	425,017	68,002 72
Montgomery.....	2,155	344 80	20	2 20	311,391	49,822 56
Morris.....					277,445	44,391 20
Morton.....	70	11 20	200	22 00	10,864	1,738 24
Nemaha.....	5,077	812 32	4,915	540 65	465,591	74,494 56
Neosho.....	884	141 44	2,362	259 82	401,653	64,264 48
Ness.....	120	19 20	1,105	121 55	107,055	17,128 80
Norton.....	1,000	160 00	2,300	253 00	292,320	46,771 20
Osage.....	1,685	269 60	15,335	1,686 85	472,371	75,579 31
Osborne.....	14,000	2,240 00	15,110	1,662 10	356,499	57,039 84
Ottawa.....	24,630	3,940 80	2,200	242 00	335,094	53,615 04
Pawnee.....	7,110	1,137 60	3,025	332 75	143,031	22,884 96
Phillips.....	6,304	1,008 64	7,475	822 25	418,773	67,003 68
Pottawatomie.....	9,130	1,460 80			411,948	65,911 68
Pratt.....	349	55 84	1,555	171 05	153,631	24,580 96
Rawlins.....	4,010	641 60	828	91 08	148,890	23,822 40
Reno.....	2,910	465 60	11,930	1,312 30	478,414	76,546 24
Republic.....	92	14 72	1,230	135 30	464,184	74,269 44
Rice.....	3,134	501 44	165	18 15	360,419	57,667 04
Riley.....	2,790	446 40	285	31 35	840,381	134,460 96
Rooks.....	12,398	1,983 68	350	38 50	213,061	34,089 76
Rush.....	446	71 36	1,798	197 78	102,978	16,476 48
Russell.....	6,206	992 96	160	17 60	186,131	29,780 96
Saline.....	10,020	1,603 20	8,552	940 72	325,361	52,057 76
Scott.....	26,824	4,291 84	4,020	442 20	25,495	4,079 20
Sedgwick.....	42,136	6,741 76	956	105 16	540,819	86,531 04
Seward.....					17,696	2,831 36
Shawnee.....	30	4 80	80	8 80	500,679	80,108 64
Sheridan.....	36,665	5,866 40			74,780	11,964 80
Sherman.....	200	32 00	190	20 90	136,347	21,815 52
Smith.....	920	147 20	3,625	398 75	423,326	67,732 16
Stafford.....	13,284	2,125 44	9,210	1,013 10	190,084	30,413 44
Stanton.....			160	17 60	23,119	3,699 04
Stevens.....	120	19 20	450	49 50	18,302	2,928 32
Sumner.....	6,230	996 80	5,475	602 25	759,704	121,552 64
Thomas.....	75	120 00	5,020	552 20	133,737	21,397 92
Trego.....	25,000	4,000 00	2,145	235 95	73,374	11,739 84
Wabaunsee.....	4,342	694 72	500	55 00	298,355	47,736 80
Wallace.....	50,700	8,112 02	140	15 40	50,217	8,034 72
Washington.....	7,500	1,200 00	3,502	385 22	550,123	88,019 68
Wichita.....	6,085	973 60	30	3 30	21,740	3,478 40
Wilson.....	5,552	888 32			303,932	48,629 12
Woodson.....	92,010	14,721 60	9,170	1,008 70	176,100	28,176 00
Wyandotte.....					121,685	19,469 60
Totals.....	1,142,636	\$182,821 76	365,961	\$40,255 71	27,347,613	\$4,375,618 08

PRODUCTS OF LIVE STOCK—CONTINUED.

COUNTIES.	WOOL CLIP, 1893.		CHEESE, 1894.		BUTTER, 1894.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Allen	2,175	\$282 75	16,500	\$1,980 00	305,385	\$48,861 60
Anderson	5,140	668 20	31,205	3,744 60	248,114	39,698 24
Atchison	750	97 50	4,850	582 00	248,978	39,836 48
Barber	11,500	1,495 00	1,300	156 00	137,692	22,030 72
Barton	5,628	731 64	2,330	279 60	220,955	35,352 80
Bourbon	515	66 95			401,743	64,278 88
Brown	4,148	539 24	1,630	195 60	394,609	63,137 44
Butler	205,167	26,671 71	1,380	165 60	560,406	89,664 96
Chase	2,500	325 00	200	24 00	164,448	26,311 68
Chautauqua	255	33 15			272,436	43,589 76
Cherokee	4,172	542 36	4,510	541 20	369,807	59,169 12
Cheyenne	550	71 50	350	42 00	110,829	17,732 64
Clark	3,000	390 00	500	60 00	42,501	6,800 16
Clay	846	109 98	4,700	564 00	366,031	58,564 96
Cloud	4,368	567 84	16,100	1,932 00	495,228	79,236 48
Coffey	12,464	1,620 32			356,369	57,019 04
Comanche	400	52 00	550	66 00	44,541	7,126 56
Cowley	5,212	677 56	5,580	669 60	597,603	95,616 48
Crawford	6,610	859 30	3,493	419 16	311,733	49,877 28
Decatur	210	27 30	1,050	126 00	176,980	28,316 80
Dickinson	6,396	831 48	425	51 00	278,835	44,613 60
Doniphan	978	127 14	30	3 60	230,498	36,879 68
Douglas	11,159	1,450 67	100	12 00	414,181	66,268 96
Edwards	25,325	3,292 25	11,130	1,335 60	85,545	13,687 20
Elk	112	14 56	3,180	381 60	328,675	52,588 00
Ellis	393	51 09	135	16 20	107,449	17,191 84
Ellsworth	4,988	648 44	6,550	786 00	167,735	26,837 60
Finney	25,898	3,366 74	4,010	481 20	91,906	14,704 97
Ford	749	97 37	500	60 00	97,994	15,679 04
Franklin	3,885	505 05			392,855	62,856 80
Geary	4,835	628 55	200	24 00	200,667	32,106 72
Gove	5,434	706 42	620	74 40	49,320	7,891 20
Graham	17,577	2,285 01	9,350	1,122 00	117,899	18,863 84
Grant			350	42 00	16,073	2,571 68
Gray			1,500	180 00	42,834	6,853 44
Greeley			675	81 00	19,270	3,083 20
Greenwood	12,448	1,618 24	2,962	355 44	432,306	69,168 96
Hamilton	1,287	167 31	325	39 00	77,195	12,351 20
Harper			1,370	164 40	216,115	34,578 40
Harvey	15,955	2,074 15	3,193	383 16	273,090	43,694 40
Haskell					23,128	3,700 48
Hodgeman	39,764	5,169 32	9,000	1,080 00	68,008	10,881 28
Jackson	330	120 90	301	36 12	286,069	45,771 04
Jefferson	3,324	432 12	900	108 00	362,041	57,926 56
Jewell	208	27 04	1,000	120 00	548,870	87,819 20
Johnson	7,942	1,032 46	8,520	1,022 40	379,782	60,765 12
Kearny	7,070	919 10	600	72 00	22,835	3,653 60
Klingman	3,500	455 00	1,100	132 00	184,977	29,596 32
Klowa			50	6 00	79,887	12,781 92
Labette	5,467	710 71	7,955	954 60	361,561	57,849 76
Lane	3,680	478 40	300	36 00	48,027	7,684 32
Leavenworth	8,127	1,056 51	90	10 80	413,860	66,217 60
Lincoln	30	3 90	350	42 00	270,016	43,202 56
Linn	3,215	417 95	900	108 00	369,395	59,103 20
Logan	17,604	2,288 52	2,030	243 60	58,718	9,394 88
Lyon	3,773	490 49	18,350	2,202 00	397,975	63,676 00
Marion	34,167	4,441 71	930	111 60	394,865	63,178 40
Marshall	3,854	501 02	3,560	427 20	615,665	98,506 40
McPherson	4,702	611 26	2,511	301 32	431,232	68,997 12
Meade	13,065	1,698 45	2,815	337 80	42,809	6,849 44
Miami	4,352	565 76	1,550	186 00	411,375	65,820 00
Mitchell	11,342	1,474 46	530	63 60	422,801	67,648 16
Montgomery	5,254	683 02			327,631	52,420 96
Morris	9,660	1,255 80			377,434	60,389 44
Morton			15	1 80	10,915	1,746 40
Nemaha	4,680	608 40	9,240	1,108 80	458,648	73,383 68
Neosho	550	71 50	1,250	150 00	433,052	69,288 32
Ness			6,250	750 00	197,630	31,620 80
Norton	52	6 76	2,550	306 00	388,966	62,234 56
Osage	8,950	1,163 50	4,300	516 00	460,638	73,702 08
Osborne	7,073	919 49	11,625	1,395 00	363,138	58,102 08
Ottawa	4,719	613 47	475	57 00	308,262	49,321 92
Pawnee	5,192	674 96	210	25 20	150,805	24,128 80
Phillips	5,902	767 26	1,600	192 00	397,150	63,544 00
Pottawatomie	8,635	1,122 55	197	23 64	359,100	57,456 00
Pratt	84	10 92	2,620	314 40	128,791	20,606 56
Rawlins	3,431	446 03	195	23 40	134,179	21,468 64

PRODUCTS OF LIVE STOCK—CONCLUDED.

COUNTIES.	WOOL CLIP, 1893.		CHEESE, 1894.		BUTTER, 1894.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Reno.....	910	\$118 30	21,955	\$2,634 60	501,842	\$80,294 72
Republic.....	75	9 75	825	99 00	425,340	68,054 40
Itice.....	5,035	654 55	400	48 00	423,285	67,725 60
Riley.....	120	15 60	100	12 00	237,971	38,075 36
Rooks.....	5,368	697 84	47	5 64	252,093	40,334 88
Rush.....	6,731	875 03	2,830	339 60	109,186	17,469 76
Russell.....	20,800	2,704 00	.....	.....	204,115	32,658 40
Saline.....	8,460	1,099 80	4,622	554 64	359,964	57,594 24
Scott.....	34,394	4,471 22	3,000	360 00	23,181	3,708 96
Sedgwick.....	44,493	5,784 09	495	59 40	626,267	100,202 72
Seward.....	.....	.....	.....	.....	13,246	2,119 36
Shawnee.....	960	124 80	30	3 60	542,941	86,870 56
Sheridan.....	22,200	2,886 00	130	15 60	85,826	13,732 60
Sherman.....	.....	.....	100	12 00	122,510	19,601 60
Smith.....	1,177	153 01	4,130	495 60	450,080	72,012 80
Stafford.....	12,240	1,591 20	2,100	252 00	254,317	40,690 72
Stanton.....	1,900	247 00	.....	.....	21,008	3,361 28
Stevens.....	1,137	147 81	.....	.....	16,192	2,590 72
Sumner.....	6,800	884 00	4,130	495 60	759,620	121,539 20
Thomas.....	225	29 25	1,361	163 32	121,068	19,370 88
Trego.....	26,800	3,484 00	2,200	264 00	68,975	11,036 00
Wabauensee.....	1,207	156 91	7,550	906 00	308,087	49,293 92
Wallace.....	17,000	2,210 00	246	29 52	44,420	7,107 20
Washington.....	2,421	314 73	4,240	508 80	572,141	91,542 56
Wichita.....	112	14 56	200	24 00	19,566	3,130 56
Wilson.....	3,928	510 64	4,200	504 00	345,978	55,356 48
Woodson.....	81,632	10,612 16	8,370	1,004 40	211,936	33,909 76
Wyandotte.....	.....	.....	800	96 00	133,991	21,438 56
Totals.....	959,452	\$124,728 76	320,763	\$38,491 56	27,412,211	\$4,385,953 76

GARDEN AND HORTICULTURAL PRODUCTS AND WOOD MARKETED.

TABLE showing the value for the years 1893 and 1894.

COUNTIES.	1893.			1894.		
	Garden products marketed.	Horticultural products marketed.	Wood marketed.	Garden products marketed.	Horticultural products marketed.	Wood marketed.
Allen.....	\$2,415	\$723	\$1,064	\$1,156	\$349	\$476
Anderson.....	4,378	25,217	13,619	3,219	546	3,397
Atchison.....	21,358	15,806	4,677	22,699	10,148	6,044
Barber.....	1,402	705	723	595	1,678	952
Barton.....	6,718	1,695	57	5,619	165	123
Bourbon.....	8,138	4,755	1,087	10,896	1,193	9,119
Brown.....	6,113	2,597	5,488	6,865	5,158	3,655
Butler.....	5,469	7,214	2,583	12,590	3,196	3,281
Chase.....	4,336	952	1,255	3,800	379	697
Chautauqua.....	3,787	3,951	1,340	3,479	12,790	1,115
Cherokee.....	18,497	10,124	646	20,429	3,004	1,861
Cheyenne.....	1,669	.....	75	1,066	.....	125
Clark.....	597	.....	.....	20	6	.....
Clay.....	2,706	3,510	1,422	3,784	1,554	642
Cloud.....	3,045	1,044	321	3,044	226	640
Coffey.....	4,184	5,380	3,011	3,559	2,033	1,298
Comanche.....	1,457	5	210	270	108	94
Cowley.....	23,133	13,409	4,215	19,687	13,379	2,370
Crawford.....	11,196	14,158	670	13,058	1,462	378
Decatur.....	5,060	8	285	2,919	.....	337
Dickinson.....	4,565	1,385	762	3,523	1,791	669
Doniphan.....	4,741	20,217	8,328	6,768	26,230	5,212
Douglas.....	68,167	21,651	8,006	68,780	17,175	4,115
Edwards.....	2,218	60	150	1,662	.....	260
Elk.....	2,595	5,754	1,312	2,026	1,737	694
Ellis.....	4,389	200	.....	869	2	162
Ellsworth.....	3,410	705	215	2,682	20	204
Finney.....	7,406	575	.....	6,825	12	97
Ford.....	4,128	1,010	1	1,218	440	.....
Franklin.....	10,997	1,948	2,914	6,819	1,269	987
Geary.....	5,907	2,635	5,690	9,000	3,706	4,982
Gove.....	1,454	.....	.....	9,340	.....	.....

GARDEN AND HORTICULTURAL PRODUCTS AND WOOD MARKETED—CONCLUDED.

COUNTIES.	1893.			1894.		
	Garden products marketed.	Horticultural products marketed.	Wood marketed.	Garden products marketed.	Horticultural products marketed.	Wood marketed.
Graham.....	\$6,544	\$102	\$154	\$1,726	\$50	* \$245
Grant.....	202	20		6		
Gray.....	255			338		
Greeley.....	75					
Greenwood.....	5,724	3,124	1,562	7,460	1,982	1,658
Hamilton.....	768	1,280		429	1,035	6
Harper.....	13,977	6,925	51	3,615	1,801	17
Harvey.....	7,459	4,474	130	3,884	4,195	716
Haskell.....	61	11		21		
Hodgeman.....	1,289			65		
Jackson.....	3,937	2,766	5,169	2,922	2,094	4,362
Jefferson.....	4,287	1,187	6,317	13,174	3,110	6,478
Jewell.....	1,424	985	215	324		681
Johnson.....	17,599	7,678	853	15,866	2,297	826
Kearny.....	2,239	200		4,208	25	
Kingman.....	2,403	1,449		1,550	17,148	
Kiowa.....	1,129			229	100	
Labette.....	11,952	6,659	1,166	8,705	1,980	1,215
Lane.....	1,151	2,464		3,490	50	
Leavenworth.....	40,656	10,060	11,580	36,332	14,632	8,720
Lincoln.....	1,049	530	715	542	150	422
Linn.....	2,787	690	1,190	2,461	181	25
Logan.....	1,176	14		1,614		
Lyon.....	14,602	7,605	2,121	15,995	5,465	1,743
Marion.....	6,085	69,173	540	4,234	57,288	250
Marshall.....	2,839	1,379	3,937	2,218	971	4,416
McPherson.....	5,566	2,494	728	3,135	2,414	737
Meade.....	1,783	35	9	1,046		
Miami.....	7,025	4,000	1,325	12,387	972	3,339
Mitchell.....	5,990	3,869	751	4,486	885	1,002
Montgomery.....	7,107	4,461	25	8,989	5,525	503
Morris.....	2,644	1,100	1,654	2,391	1,079	1,042
Morton.....	29			20		
Nemaha.....	1,876	384	5,388	5,388	1,626	4,153
Neosho.....	34,330	3,129	13,386	3,441	1,448	6,720
Ness.....	6,369	60	11	963		20
Norton.....	4,305	15,908	254	2,791	1,056	393
Osage.....	6,956	4,051	5,922	9,129	1,415	1,041
Osborne.....	3,188		229	1,273		591
Ottawa.....	2,671	7,370	826	1,475	1,451	755
Pawnee.....	2,051	698	73	811		20
Phillips.....	2,018	20,126	488	849	300	561
Pottawatomie.....	1,192	3,352	5,544	2,423	3,571	4,865
Pratt.....	2,912	165		466	74	
Rawlins.....	5,814	1,832	248	2,456	40	46
Reno.....	17,964	25,779	421	11,413	23,794	346
Republic.....	2,821	788	648	1,922	262	513
Rice.....	8,243	2,215	71	5,277	3,228	682
Riley.....	11,573	1,730	4,084	8,544	8,326	2,337
Rooks.....	2,259	60	45	4,434	225	454
Rush.....	1,954	9	70	409		21
Russell.....	1,179	400	831	703		319
Saline.....	5,336	8,205	631	6,265	3,223	1,203
Scott.....	497	4,544		231		
Sedgwick.....	28,536	13,461	317	27,714	13,258	1,200
Seward.....	673			740		
Shawnee.....	54,230	9,246	1,475	47,934	12,382	990
Sheridan.....	3,313	100	11	1,283	53	
Sherman.....	4,164			1,671		
Smith.....	3,089	12,739	176	1,590	2,370	208
Stafford.....	3,714	84,422	12	2,738	1,138	28
Stanton.....	* 169	4		32		
Stevens.....	436	175		15		
Sumner.....	13,278	9,544	329	5,733	3,861	1,321
Thomas.....	1,998			380		
Trego.....	1,685	28		1,083		
Wabaunsee.....	2,148	1,312	4,595	16,979	5,967	1,946
Wallace.....	192			999		28
Washington.....	7,232	3,648	9,312	1,552	2,752	1,535
Wichita.....	236	3,600		430		
Wilson.....	3,188	2,999	569	4,401	820	1,039
Woodson.....	3,295	723	744	3,323		1,405
Wyandotte.....	113,955	54,259	2,872	146,170	48,295	2,736
Totals.....	\$808,487	\$609,192	\$169,900	\$757,958	\$377,225	\$129,865

ORCHARDS.

TABLE showing the number of fruit trees in bearing for the year 1893.

COUNTIES.	1893.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen.....	111,907	1,239	37,462	5,584	15,542
Anderson.....	165,455	2,030	40,264	6,708	18,150
Atchison.....	154,359	1,155	25,381	2,234	10,010
Barber.....	11,141	726	95,573	4,105	3,313
Barton.....	18,866	1,127	20,050	10,124	14,830
Bourbon.....	193,221	3,242	25,701	11,562	19,942
Brown.....	181,979	1,482	53,539	6,291	14,117
Butler.....	169,761	3,817	167,509	21,293	44,288
Chase.....	45,133	1,346	31,124	2,650	10,869
Chautauqua.....	91,175	2,340	70,984	62,242	37,131
Cherokee.....	190,426	2,181	54,841	15,414	20,367
Cheyenne.....	75	.....	142	324	236
Clark.....	422	27	7,092	78	264
Clay.....	80,714	1,582	40,703	7,596	22,814
Cloud.....	68,986	565	57,328	4,704	23,710
Coffey.....	133,679	2,215	39,742	8,176	20,749
Comanche.....	1,346	115	17,630	527	694
Cowley.....	173,445	7,207	283,068	24,739	44,136
Crawford.....	153,204	2,132	23,590	9,481	19,098
Decatur.....	830	14	3,085	1,653	1,067
Dickinson.....	118,523	4,368	76,029	13,199	33,085
Doniphan.....	172,600	1,251	31,778	4,404	7,307
Douglas.....	165,177	7,810	41,602	8,892	22,524
Edwards.....	1,799	103	8,626	1,588	1,414
Elk.....	90,888	3,051	91,211	17,422	20,097
Ellis.....	4,426	91	4,878	2,068	3,891
Ellsworth.....	13,476	311	20,919	1,863	6,197
Finney.....	5,115	145	8,305	9,515	1,415
Ford.....	1,325	156	13,550	6,035	1,297
Franklin.....	117,241	1,759	32,212	6,933	18,623
Geary.....	43,438	2,582	16,014	2,371	10,929
Gove.....	9	.....	291	2,132	86
Graham.....	385	45	1,177	885	773
Grant.....	538	38	4,183	504	148
Gray.....	282	.....	915	520	95
Greeley.....	1	.....	20	74	31
Greenwood.....	132,649	2,074	63,581	8,437	15,285
Hamilton.....	486	32	1,880	102	187
Harper.....	41,147	1,074	204,088	29,515	11,222
Harvey.....	92,049	4,557	88,380	20,184	29,784
Haskell.....	215	.....	853	705	65
Hodgeman.....	159	2	1,452	1,126	64
Jackson.....	109,911	978	27,197	3,351	12,273
Jefferson.....	112,285	2,690	39,698	3,551	19,179
Jewell.....	81,835	959	95,244	6,028	44,324
Johnson.....	114,691	2,662	27,264	4,384	18,461
Kearny.....	808	65	986	646	391
Kingman.....	33,445	1,962	161,102	11,235	13,935
Kiowa.....	723	69	10,867	761	736
Labette.....	182,762	3,461	37,127	10,598	20,011
Lane.....	659	.....	1,382	961	265
Leavenworth.....	214,591	4,211	25,744	2,588	11,315
Lincoln.....	14,486	394	19,695	4,446	6,597
Linn.....	111,460	1,867	26,673	3,973	13,867
Logan.....	16	.....	.....	76	138
Lyon.....	137,147	1,733	60,077	8,215	17,339
Marion.....	77,084	3,756	58,002	10,894	27,873
Marshall.....	119,337	206	56,447	7,920	12,843
McPherson.....	103,954	3,769	84,960	17,223	33,203
Meade.....	849	33	7,043	2,112	639
Miami.....	87,203	2,773	29,250	3,175	15,395
Mitchell.....	56,998	1,185	41,116	9,176	16,369
Montgomery.....	136,713	3,759	50,969	12,778	23,282
Morris.....	84,735	1,833	31,142	4,481	15,956
Morton.....	50	.....	1,159	131	51
Nemaha.....	235,092	818	32,289	3,815	15,745
Neosho.....	178,051	2,563	43,064	10,959	24,723
Ness.....	1,178	118	5,258	4,310	1,029
Norton.....	2,895	26	4,839	1,071	2,524
Osage.....	145,622	2,258	59,743	13,232	27,065
Osborne.....	18,664	432	11,811	4,383	5,670
Ottawa.....	48,060	857	46,031	5,405	19,656
Pawnee.....	4,806	382	5,205	23,989	5,193
Phillips.....	8,374	431	5,533	2,172	6,022
Pottawatomie.....	107,573	1,206	28,235	4,518	19,121

ORCHARDS—CONTINUED—Number of fruit trees in bearing.

COUNTIES.	1893.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Pratt.....	10,294	424	77,678	6,769	5,922
Rawlins.....	463	20	1,231	1,770	501
Reno.....	136,398	5,748	203,735	28,179	30,337
Republic.....	123,381	1,359	70,510	10,686	27,181
Rice.....	47,958	1,793	61,156	15,638	25,414
Riley.....	113,025	1,365	28,294	3,422	16,754
Rooks.....	4,929	62	14,242	1,637	4,161
Rush.....	2,681	48	5,420	2,780	4,557
Russell.....	4,991	99	5,636	2,348	4,143
Saline.....	60,560	1,905	31,774	7,062	14,293
Scott.....	100	11	400	226	103
Sedgwick.....	152,282	6,854	177,588	21,322	37,427
Seward.....	335	62	2,630	1,599	200
Shawnee.....	161,663	1,902	50,792	6,247	29,693
Sheridan.....	68	20	570	577	411
Sherman.....	25	.....	10	1,297	248
Smith.....	36,981	466	41,513	5,374	15,946
Stafford.....	21,004	796	60,095	5,618	13,802
Stanton.....	11	.....	482	1,304	20
Stevens.....	1,002	20	4,387	2,557	236
Sumner.....	187,542	6,781	435,975	18,449	56,497
Thomas.....	85	.....	446	801	335
Trego.....	323	12	1,341	2,387	707
Wabauusee.....	88,161	1,544	42,604	3,897	15,258
Wallace.....	4	.....	50	293	56
Washington.....	148,836	1,330	46,642	4,289	26,854
Wichita.....	1	.....	1,191	6,350	64
Wilson.....	106,046	3,052	35,682	11,595	19,980
Woodson.....	61,943	842	36,945	3,899	16,447
Wyandotte.....	105,609	1,005	20,091	5,165	7,867
Totals.....	7,056,820	149,067	4,401,013	729,753	1,353,055

ORCHARDS—CONTINUED—Number of fruit trees in bearing.

COUNTIES.	1894.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen.....	120,269	1,584	31,579	5,436	13,280
Anderson.....	90,389	1,957	27,633	4,568	17,163
Atchison.....	163,091	1,079	15,133	2,157	7,719
Barber.....	9,150	705	75,808	1,822	3,632
Barton.....	21,912	1,141	18,311	5,602	16,705
Bourbon.....	219,163	3,344	22,273	13,636	17,016
Brown.....	180,399	1,298	43,456	5,310	10,520
Butler.....	172,382	4,005	168,153	22,675	42,290
Chase.....	41,770	2,181	21,984	5,230	11,238
Chautauqua.....	92,291	2,413	51,894	28,484	16,944
Cherokee.....	205,172	1,519	42,525	13,947	18,430
Cheyenne.....	240	1	594	603	398
Clark.....	507	60	7,751	96	197
Clay.....	83,103	1,251	29,979	5,094	21,877
Cloud.....	69,894	905	45,445	4,492	23,304
Coffey.....	136,131	2,304	36,031	7,074	19,316
Comanche.....	1,523	150	15,495	1,897	853
Cowley.....	172,113	6,235	213,874	19,532	41,293
Crawford.....	116,729	1,843	19,427	8,534	19,145
Decatur.....	1,376	.....	2,702	377	1,112
Dickinson.....	123,043	6,998	63,480	21,293	31,625
Doniphan.....	136,326	1,181	24,162	4,767	5,429
Douglas.....	158,539	6,956	34,121	7,292	16,447
Edwards.....	2,949	856	23,190	3,228	2,520
Elk.....	104,365	3,825	89,105	19,600	24,324
Ellis.....	6,893	8,330	189	14,916	5,532
Ellsworth.....	12,526	291	11,821	1,486	5,592
Finney.....	4,960	331	3,746	8,528	1,129
Ford.....	1,657	86	13,671	7,300	2,279
Franklin.....	114,671	2,013	25,416	7,264	16,343
Geary.....	39,751	1,591	12,712	2,620	11,701

ORCHARDS—CONTINUED—Number of fruit trees in bearing.

COUNTIES.	1894.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Gove.....	12		423	733	128
Graham.....	344	27	1,680	577	574
Grant.....	647	32	1,692	466	106
Gray.....	492	306	3,694	1,196	182
Greeley.....	4		15	1	
Greenwood.....	120,312	2,299	53,302	11,468	17,020
Hamilton.....	712	12	683	333	284
Harper.....	45,812	1,316	167,389	9,487	13,959
Harvey.....	88,205	4,300	70,625	12,920	24,854
Haskell.....	20	8	1,276	1,211	61
Hodgeman.....	48		653	1,523	489
Jackson.....	131,706	1,153	19,061	3,101	11,666
Jefferson.....	121,061	2,110	40,476	3,721	16,473
Jewell.....	108,084	1,459	99,917	9,497	36,315
Johnson.....	103,883	2,676	28,125	4,472	13,934
Kearny.....	1,485	116	1,386	849	558
Kingman.....	35,118	946	142,474	9,428	10,924
Kiowa.....	3,411	135	9,175	403	658
Labette.....	207,919	2,398	29,920	10,723	18,280
Lane.....	617	11	1,223	579	119
Leavenworth.....	196,389	4,033	20,911	2,187	8,452
Lincoln.....	14,309	10,787	14,754	2,372	6,005
Linn.....	156,696	2,013	32,121	8,128	17,657
Logan.....	63	6	81	4,986	55
Lyon.....	161,775	2,031	57,664	14,108	26,893
Marion.....	83,343	4,162	47,134	10,505	27,566
Marshall.....	140,074	1,411	30,262	4,973	21,432
McPherson.....	104,050	3,798	70,052	16,724	33,159
Meade.....	1,358	32	9,677	2,082	959
Miami.....	105,896	2,110	30,197	3,491	14,293
Mitchell.....	62,965	840	32,953	8,729	16,099
Montgomery.....	150,343	2,600	42,585	19,955	23,421
Morris.....	88,410	1,632	24,658	3,686	14,219
Morton.....	161	4	684	127	121
Nemaha.....	137,049	833	25,432	3,332	11,314
Neosho.....	147,625	2,815	36,181	14,602	21,240
Ness.....	1,088	36	2,865	3,449	597
Norton.....	4,221	374	3,271	2,562	3,239
Osage.....	165,911	2,389	57,836	8,477	26,986
Osborne.....	17,776	338	15,356	1,494	6,249
Ottawa.....	58,042	1,070	36,430	5,037	24,181
Pawnee.....	5,770	409	3,655	14,325	3,692
Phillips.....	8,015	194	5,760	2,080	4,551
Pottawatomie.....	111,928	1,292	25,974	5,203	21,837
Pratt.....	11,651	903	63,385	6,305	6,019
Rawlins.....	444	9	935	863	449
Reno.....	101,191	5,500	226,248	35,147	27,358
Republic.....	120,442	1,788	76,811	10,604	29,313
Rice.....	53,868	2,429	57,759	9,211	28,520
Riley.....	92,117	1,056	20,671	2,569	12,193
Rooks.....	5,359	110	10,067	3,420	4,832
Rush.....	2,266	54	3,745	11,431	4,460
Russell.....	5,765	96	4,441	1,414	3,345
Saline.....	65,620	2,017	30,598	25,389	14,841
Scott.....	151	6	384	536	151
Sedgwick.....	168,606	6,980	166,371	25,788	37,149
Seward.....	236	18	2,664	1,314	154
Shawnee.....	168,485	1,675	41,680	5,570	22,769
Sheridan.....	1,653	3	578	688	453
Sherman.....	145			2,062	278
Smith.....	35,683	259	41,154	4,080	14,847
Stafford.....	19,190	954	59,524	17,414	12,760
Stanton.....	2		115	316	33
Stevens.....	882	50	2,686	895	130
Sumner.....	181,687	7,322	339,412	18,413	59,164
Thomas.....	216	3	438	7,396	885
Trego.....	802	39	1,799	2,380	686
Wabaunsee.....	103,941	1,446	28,764	4,180	15,747
Wallace.....	7		40	561	105
Washington.....	155,425	1,089	41,679	5,273	21,415
Wichita.....	262	8	53	132	333
Wilson.....	129,327	2,287	31,610	10,740	22,018
Woodson.....	65,684	1,261	22,664	4,626	16,768
Wyandotte.....	119,004	2,428	19,051	6,301	10,385
Totals.....	7,106,544	170,736	3,786,660	727,180	1,293,714

ORCHARDS—CONTINUED—Number of fruit trees *not* in bearing.

COUNTIES.	1893.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen.....	58,488	2,158	4,985	1,987	3,276
Anderson.....	59,777	1,865	5,741	5,140	4,536
Atchison.....	82,845	1,934	8,757	1,496	1,524
Barber.....	48,769	3,810	57,468	4,283	8,045
Barton.....	37,911	3,440	23,507	8,097	17,960
Bourbon.....	64,232	1,874	4,203	3,395	3,623
Brown.....	37,756	2,379	7,734	2,467	2,703
Butler.....	103,444	4,082	19,913	4,957	8,263
Chase.....	40,202	1,734	13,125	1,123	4,114
Chautauqua.....	56,239	1,899	4,167	2,525	2,621
Cherokee.....	137,813	1,595	7,399	2,422	4,981
Cheyenne.....	10,579	210	5,240	3,310	1,464
Clark.....	4,471	166	10,629	354	688
Clay.....	57,316	3,487	11,882	1,664	6,152
Cloud.....	53,810	1,701	11,401	2,122	6,485
Coffey.....	73,549	2,554	13,235	3,846	5,819
Comanche.....	7,183	395	17,051	1,184	972
Cowley.....	116,074	10,021	22,013	7,121	9,355
Crawford.....	67,623	1,190	3,828	2,127	2,581
Decatur.....	12,652	274	7,198	1,187	2,204
Dickinson.....	86,404	9,444	10,806	5,127	6,986
Doniphan.....	85,230	2,464	9,836	3,456	3,202
Douglas.....	70,982	5,661	6,996	3,887	4,145
Edwards.....	10,857	1,151	27,691	2,825	3,085
Elk.....	67,559	3,882	8,656	4,374	3,987
Ellis.....	9,428	319	14,074	1,882	6,644
Ellsworth.....	28,653	1,151	9,098	1,726	7,248
Finney.....	22,145	845	14,205	8,130	3,020
Ford.....	8,729	433	37,155	6,778	3,822
Franklin.....	67,086	2,252	6,845	1,631	3,749
Geary.....	22,331	1,586	2,768	1,074	3,507
Gove.....	1,895	45	7,667	3,250	1,812
Graham.....	6,226	360	13,241	2,142	3,300
Grant.....	-2,101	159	15,934	2,841	220
Gray.....	3,680	183	15,835	3,508	1,061
Greeley.....	1,814	152	11,151	914	716
Greenwood.....	99,839	11,772	64,872	3,762	5,500
Hamilton.....	7,302	436	10,863	1,908	897
Harper.....	75,182	6,346	43,477	8,691	12,504
Harvey.....	38,627	3,775	11,892	5,881	5,822
Haskell.....	2,743	59	14,934	5,275	565
Hodgeman.....	2,168	151	5,117	2,220	1,049
Jackson.....	66,984	1,696	8,572	2,898	4,251
Jefferson.....	62,827	2,482	9,902	1,678	3,712
Jewell.....	166,333	2,090	64,474	3,072	14,385
Johnson.....	46,836	2,263	7,339	2,392	2,926
Kearny.....	14,144	748	9,327	1,928	843
Kingman.....	67,073	3,487	42,645	4,913	10,701
Kiowa.....	13,048	1,181	37,628	3,742	1,808
Labette.....	131,652	1,552	3,248	1,964	2,679
Lane.....	3,892	144	6,299	1,115	798
Leavenworth.....	174,708	4,780	6,351	1,807	2,169
Lincoln.....	32,638	1,550	22,327	2,837	7,109
Linn.....	57,476	1,491	7,142	5,837	5,201
Logan.....	3,567	98	11,842	9,011	955
Lyon.....	91,056	2,715	15,521	2,994	5,292
Marion.....	76,992	5,854	16,706	4,436	8,541
Marshall.....	112,110	1,673	17,685	3,910	4,439
McPherson.....	74,752	4,305	11,160	4,079	7,785
Meade.....	5,439	262	17,117	1,786	1,708
Miami.....	73,160	3,500	7,637	1,942	3,405
Mitchell.....	63,680	2,201	13,848	4,045	6,029
Montgomery.....	69,564	1,897	5,356	3,829	3,803
Morris.....	74,176	2,899	10,244	2,230	4,536
Morton.....	1,043	22	4,240	600	294
Nemaha.....	73,754	1,588	9,486	4,267	5,968
Neosho.....	69,133	1,698	2,879	2,577	3,009
Ness.....	6,103	226	12,527	6,802	3,070
Norton.....	21,007	280	12,607	2,261	4,401
Osage.....	151,380	3,457	14,277	5,206	7,897
Osborne.....	24,062	776	14,479	1,280	4,657
Ottawa.....	43,790	2,435	8,240	2,156	7,131
Pawnee.....	15,125	2,267	14,919	2,276	5,230
Phillips.....	24,087	659	12,361	2,011	6,732
Pottawatomie.....	67,385	1,701	8,494	1,943	4,742
Pratt.....	46,076	2,429	63,584	8,569	11,844
Rawlins.....	6,838	112	4,737	1,884	1,667

ORCHARDS—CONTINUED—Number of fruit trees *not* in bearing.

COUNTIES.	1893.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Reno.....	161,110	13,673	68,114	15,185	19,403
Republic.....	95,198	4,011	17,705	3,707	9,757
Rice.....	71,668	7,179	24,108	9,067	20,788
Riley.....	68,545	2,041	5,738	1,660	3,827
Rooks.....	17,100	316	20,285	2,934	6,612
Rush.....	8,710	353	4,356	4,089	7,401
Russell.....	10,258	281	7,545	841	2,973
Saline.....	56,194	3,219	7,256	2,810	5,819
Scott.....	1,397	147	17,332	426	427
Sedgwick.....	105,718	6,263	19,263	6,452	8,352
Seward.....	2,666	98	5,295	1,528	233
Shawnee.....	149,411	3,934	12,024	5,041	7,823
Sheridan.....	3,131	131	4,621	577	392
Sherman.....	7,764	266	9,757	6,890	1,628
Smith.....	55,268	1,235	32,729	4,384	12,460
Stafford.....	58,688	3,589	59,510	5,949	14,066
Stanton.....	1,414	806	27,145	1,460	1,053
Stevens.....	2,683	138	16,632	2,857	366
Sumner.....	117,573	10,064	33,453	6,982	17,550
Thomas.....	10,036	126	9,326	4,759	1,643
Trego.....	3,710	228	7,728	4,063	1,309
Wabauensee.....	89,760	2,926	12,354	2,090	5,182
Wallace.....	2,535	157	4,827	2,020	338
Washington.....	208,668	4,291	21,512	3,476	12,264
Wichita.....	2,402	69	3,455	2,207	673
Wilson.....	62,930	1,758	4,734	1,464	2,019
Woodson.....	42,646	1,392	6,293	2,142	4,135
Wyandotte.....	50,943	1,761	7,723	4,912	5,389
Totals.....	5,351,230	236,424	1,628,617	366,338	523,815

ORCHARDS—CONTINUED—Number of fruit trees *not* in bearing.

COUNTIES.	1894.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Allen.....	42,572	1,705	5,201	1,812	2,548
Anderson.....	55,136	1,414	8,042	1,990	3,059
Atchison.....	58,717	1,632	4,293	649	1,058
Barber.....	26,232	1,826	40,091	3,094	3,250
Barton.....	57,453	3,465	23,735	5,501	15,338
Bourbon.....	41,337	1,135	2,850	1,625	2,452
Brown.....	33,053	2,599	10,726	3,314	2,667
Butler.....	101,870	3,989	23,415	3,169	6,639
Chase.....	33,863	1,140	12,837	1,974	3,516
Chautauqua.....	45,946	1,709	7,707	1,710	2,569
Cherokee.....	93,095	1,266	4,834	2,117	2,591
Cheyenne.....	9,742	155	4,992	3,085	1,146
Clark.....	3,358	517	6,278	327	610
Clay.....	52,564	2,322	12,062	1,192	5,090
Cloud.....	50,923	1,505	12,070	2,266	7,194
Coffey.....	71,632	1,994	15,849	4,107	6,441
Comanche.....	3,374	174	7,533	832	1,014
Cowley.....	99,762	7,666	5,594	7,133	17,228
Crawford.....	56,358	716	2,439	1,694	1,943
Decatur.....	12,169	376	7,288	1,312	2,062
Dickinson.....	72,991	5,225	19,714	4,061	7,568
Doniphan.....	73,074	3,268	12,570	6,231	2,900
Douglas.....	67,233	5,359	9,360	2,241	2,907
Edwards.....	12,099	1,582	26,865	4,465	4,657
Elk.....	54,193	2,426	9,593	7,950	3,191
Ellis.....	5,067	99	9,389	2,196	4,202
Ellsworth.....	20,600	794	8,987	1,266	6,439
Finney.....	14,285	482	10,111	14,981	1,615
Ford.....	6,685	483	23,692	7,698	4,056
Franklin.....	67,974	2,393	6,868	2,634	3,688
Geary.....	25,824	1,679	3,983	925	2,856

ORCHARDS—CONCLUDED—Number of fruit trees *not* in bearing.

COUNTIES.	1894.				
	Apple.	Pear.	Peach.	Plum.	Cherry.
Gove.....	2,465	214	4,927	1,582	451
Graham.....	7,428	462	7,517	5,669	1,866
Grant.....	722	9	7,821	891	112
Gray.....	2,483	43	10,272	3,998	862
Greeley.....	721	26	5,196	389	224
Greenwood.....	90,502	11,624	13,944	4,942	6,577
Hamilton.....	3,225	227	4,261	909	556
Harper.....	51,496	4,739	18,736	4,738	7,863
Harvey.....	40,263	3,618	13,372	4,811	4,539
Haskell.....	864	11	3,234	1,766	236
Hodgeman.....	1,611	120	4,598	2,166	914
Jackson.....	97,775	1,377	8,847	2,299	3,506
Jefferson.....	75,940	2,634	9,005	2,066	2,817
Jewell.....	87,646	3,310	62,581	4,420	11,118
Johnson.....	48,696	2,665	8,226	2,169	2,131
Kearny.....	7,502	696	7,536	1,285	804
Kingman.....	50,129	3,929	34,654	8,338	7,733
Kiowa.....	7,881	375	29,477	1,611	1,469
Labette.....	129,833	2,016	5,790	2,474	3,026
Lane.....	3,190	65	4,071	1,143	554
Leavenworth.....	155,997	27,180	19,702	1,794	2,386
Lincoln.....	28,424	637	17,659	2,150	5,850
Linn.....	34,902	1,551	6,886	1,863	3,372
Logan.....	2,228	46	11,693	6,453	695
Lyon.....	102,446	2,707	19,394	3,716	4,877
Marion.....	83,909	5,134	14,487	4,810	9,259
Marshall.....	72,824	2,399	13,553	3,205	5,545
McPherson.....	67,110	5,486	13,911	6,750	8,622
Meade.....	3,249	422	10,550	1,083	1,397
Miami.....	63,325	3,205	8,317	1,688	2,945
Mitchell.....	48,929	2,979	17,798	3,378	5,471
Montgomery.....	65,873	1,642	6,048	2,688	2,843
Morris.....	57,485	1,520	8,360	1,563	3,245
Morton.....	770	522	4,481	285	297
Nemaha.....	58,682	1,572	8,943	3,319	4,471
Neosho.....	460,590	2,411	13,820	6,447	10,149
Ness.....	5,060	134	9,072	3,958	2,649
Norton.....	25,789	366	13,176	2,241	5,674
Osage.....	133,888	3,534	13,856	2,596	5,090
Osborne.....	24,700	869	14,252	1,426	6,136
Ottawa.....	31,559	1,419	9,333	1,216	5,635
Pawnee.....	19,317	1,424	18,773	6,976	5,802
Phillips.....	21,387	357	13,028	2,062	5,731
Pottawatomie.....	62,809	1,778	9,099	2,022	7,820
Pratt.....	35,412	1,953	50,193	4,967	7,380
Rawlins.....	6,258	82	4,100	1,498	1,180
Renov.....	196,206	17,015	59,330	13,153	18,510
Republic.....	100,277	3,570	13,958	2,639	7,115
Rice.....	72,671	7,508	25,776	6,927	20,879
Riley.....	58,131	1,822	5,657	1,312	3,334
Rooks.....	13,809	300	12,241	1,142	6,948
Rush.....	7,480	230	6,149	3,224	8,209
Russell.....	6,441	143	6,271	579	2,119
Saline.....	48,593	3,212	14,298	3,626	6,472
Scott.....	1,416	131	7,105	515	536
Sedgwick.....	111,221	5,868	23,808	7,338	8,272
Seward.....	1,518	75	5,266	1,044	277
Shawnee.....	129,688	2,929	15,290	3,896	5,681
Sheridan.....	2,333	103	1,619	539	654
Sherman.....	7,444	112	4,032	5,772	1,131
Smith.....	45,488	1,769	33,783	4,127	13,023
Stafford.....	39,756	3,407	49,127	10,267	14,423
Stanton.....	743	20	13,219	694	213
Stevens.....	1,877	63	6,395	2,028	269
Sumner.....	94,990	7,588	84,280	6,423	12,989
Thomas.....	4,234	51	4,784	3,896	1,224
Trego.....	3,399	401	9,476	3,816	1,229
Wabaunsee.....	79,468	2,417	8,702	1,562	5,251
Wallace.....	2,705	306	7,135	5,249	410
Washington.....	143,255	3,213	29,984	3,135	10,168
Wichita.....	3,565	136	2,797	879	554
Wilson.....	67,185	2,064	5,473	2,134	2,263
Woodson.....	27,486	972	4,682	2,200	2,415
Wyandotte.....	27,520	1,896	8,206	4,455	5,564
Totals.....	5,051,374	237,938	1,442,360	343,892	474,405

NURSERIES AND SMALL FRUITS.

TABLE showing number of acres in nurseries and small fruits for the years 1893 and 1894.

COUNTIES.	1893.				1894.			
	Nurs- eries.	Rasp- berries.	Black- berries.	Straw- berries.	Nurs- eries.	Rasp- berries.	Black- berries.	Straw- berries.
Allen.....	16	32	24	6	5	153	18	6
Anderson.....		15	33	19		8	14	8
Atchison.....	2	60	27	49	42	41	52	35
Barber.....	10	18	28	10	68	3		
Barton.....	14	1	5	9			2	1
Bourbon.....	1	41	67	28		33	53	28
Brown.....	5	54	50	19		44	53	19
Butler.....	17	23	49	21	73	14	145	17
Chase.....	10	5	6	4	5	11	10	8
Chautauqua.....	7	13	51	19		4	25	19
Cherokee.....	60	54	95	177	1	35	83	154
Cheyenne.....	2							
Clark.....	1							
Clay.....	10	26	20	43	2	15	5	13
Cloud.....	2	8	12	3	4	2	7	3
Coffey.....	2	16	33	6		10	42	14
Comanche.....		1	2	1			1	
Cowley.....	172	46	251	93	57	37	241	77
Crawford.....	50	43	42	54	55	15	33	26
Decatur.....	11	166	31	700	11	49	24	
Dickinson.....	135	16	17	16	9	18	14	13
Doniphan.....		79	176	49		81	202	54
Douglas.....	154	194	166	116	152	152	123	98
Edwards.....	51	2	2	1	15	3	3	1
Elk.....	15	27	51	11	58	14	51	20
Ellis.....	48				10	3	1	
Ellsworth.....	20	5	4	1		5	7	2
Finney.....	14	11	2	6	1	8	5	5
Ford.....	26				30		1	
Franklin.....	93	22	46	20	306	20	28	23
Geary.....	36	4	9	12	35	4	8	11
Gove.....		50	50	75				
Graham.....				5	3			
Grant.....		20						
Gray.....			14					
Greeley.....	2							
Greenwood.....	35	18	49	14	1	21	48	9
Hamilton.....	10	339	21		2			
Harper.....	1	5	34	5	10	164	31	
Harvey.....	57	11	68	9	106	9	43	4
Haskell.....		10		1				
Hodgeman.....								2
Jackson.....	11	39	23	20		18	14	12
Jefferson.....	10	39	32	36	5	22	27	20
Jewell.....	13	8	7	3	19	3	2	
Johnson.....	120	38	48	25	171	50	56	27
Kearny.....		5	5		2			
Kingman.....	15	6	33	6	12	81	45	5
Kiowa.....	13	3	4	2		12	3	1
Labette.....	101	9	20	21	100	6	28	17
Lane.....		1				1	1	
Leavenworth.....	36	147	106	114	53	115	112	110
Lincoln.....	70	3	2	6	3	1	1	1
Linn.....	59	469	48	28	15	49	69	15
Logan.....		6	12	1	2			
Lyon.....	11	25	23	17	19	41	35	35
Marion.....	55	23	16	7	103	3	57	4
Marshall.....		60	17	3	116	30	23	11
McPherson.....	7	31	72	16	5	80	94	28
Meade.....			1		1	1	2	1
Miami.....	5				5	134	37	14
Mitchell.....	45	12	4	1	52	11	1	6
Montgomery.....	26	15	62	34	12	14	55	32
Morris.....	15	9	4		1	4	2	2
Morton.....								
Nemaha.....	139	23	20	12	24	20	8	8
Neosho.....	14	14	45	73	3	75	26	8
Ness.....								
Norton.....						12	12	
Osage.....	24	39	83	52	3	33	70	40
Osborne.....		5		2				
Ottawa.....	13	8	33	9	5	4	21	4
Pawnee.....	6	2	3	1	3	23	6	
Phillips.....	2	2	2	1	1			
Pottawatomie.....		7	18	11	17	14	11	10

NURSERIES AND SMALL FRUITS—CONCLUDED—Number of Acres.

COUNTIES.	1893.				1894.			
	Nurs- eries.	Rasp- berries.	Black- berries.	Straw- berries.	Nurs- eries.	Rasp- berries.	Black- berries.	Straw- berries.
Pratt.....	26	2	7	7	20	71	60	1
Rawlins.....	4	45	.....	2	.....	10	27	1
Reno.....	16	45	181	25	26	44	161	21
Republic.....	27	29	11	8	20	10	7	4
Rice.....	19	23	24	3	.....	10	318	.....
Riley.....	.....	22	14	20	.....	15	14	7
Rooks.....	8	17	1	1	5	6	6	.....
Rush.....	.....	.....	.....	.....	4	11	.....	48
Russell.....	2	.....	.....	.....	.....	.....	.....	.....
Saline.....	14	35	10	4	127	11	19	2
Scott.....	1	.....	.....	.....	.....	.....	.....	.....
Sedgwick.....	63	56	148	33	20	20	149	23
Seward.....	.....	1	1	.....	.....	1	.....	.....
Shawnee.....	651	49	71	73	822	26	35	35
Sheridan.....	.....	.....	.....	.....	.....	.....	20	.....
Sherman.....	19	.....	.....	.....	.....	.....	12	.....
Smith.....	13	4	.....	.....	29	5	1	.....
Stafford.....	2	27	33	.....	16	4	16	3
Stanton.....	.....	13	10	1	.....	.....	11	.....
Stevens.....	.....	.....	1	.....	.....	.....	.....	.....
Sumner.....	122	27	161	23	103	15	91	8
Thomas.....	1	.....	.....	2	.....	.....	.....	.....
Trego.....	.....	1	3	6	.....	7	.....	.....
Wabaunsee.....	8	17	13	16	6	8	36	13
Wallace.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington.....	75	34	34	49	15	12	7	28
Wichita.....	.....	.....	.....	1	.....	.....	.....	.....
Wilson.....	40	2	17	3	.....	9	45	5
Woodson.....	13	8	34	16	10	15	66	17
Wyandotte.....	26	324	192	116	38	392	292	106
Totals.....	3,049	3,264	3,244	2,512	3,074	2,535	3,587	1,403

VINEYARDS.

TABLE showing acres of vineyards, gallons of wine made, and value of wine.

COUNTIES.	1893.			1894.		
	Acres.	Gallons of wine.	Value.	Acres.	Gallons of wine.	Value.
Allen.....	37	120	\$120 00	38	520	\$520 00
Anderson.....	45	3,066	3,066 00	53	2,349	2,349 00
Atchison.....	223	8,110	8,110 00	201	13,840	13,840 00
Barber.....	32	383	383 00	22	52	52 00
Barton.....	29	923	923 00	8	156	156 00
Bourbon.....	54	395	395 00	40	182	182 00
Brown.....	114	3,507	3,507 00	118	3,832	3,832 00
Butler.....	71	1,864	1,864 00	92	2,491	2,491 00
Chase.....	48	826	826 00	50	1,439	1,439 00
Chautauqua.....	56	769	769 00	55	449	449 00
Cherokee.....	20	228	228 00	13	27	27 00
Cheyenne.....	1	71	71 00	3	65	65 00
Clark.....	.....	80	80 00	.....	7	7 00
Clay.....	242	7,367	7,367 00	100	3,021	3,021 00
Cloud.....	28	180	180 00	78	6	6 00
Coffey.....	43	1,413	1,413 00	59	1,456	1,456 00
Comanche.....	2	752	752 00	4	192	192 00
Cowley.....	199	1,295	1,295 00	216	1,229	1,229 00
Crawford.....	49	184	184 00	53	50	50 00
Decatur.....	.....	69	69 00	.....	17	17 00
Dickinson.....	122	4,603	4,603 00	113	2,542	2,542 00
Doniphan.....	454	61,209	61,209 00	308	21,935	21,935 00
Douglas.....	239	2,221	2,221 00	155	2,397	2,397 00
Edwards.....	3	22	22 00	1	.....	.....
Elk.....	34	228	228 00	44	371	371 00
Ellis.....	4	438	438 00	7	202	202 00
Ellsworth.....	15	558	558 00	40	111	111 00
Finney.....	84	.....	.....	9	572	572 00
Ford.....	20	60	60 00	17	16	16 00
Franklin.....	43	506	506 00	32	530	530 00
Geary.....	80	1,072	1 072 00	97	2,206	2,206 00

VINEYARDS — CONCLUDED.

COUNTIES.	1893.			1894.		
	Acres.	Gallons of wine.	Value.	Acres.	Gallons of wine.	Value.
Gove.....	7			1		
Graham.....	2	392	\$392 00	5	13	\$13 00
Grant.....						
Gray.....	1					
Greeley.....						
Greenwood.....	77	2,469	2,469 00	101	1,866	1,866 00
Hamilton.....	3					
Harper.....	73	611	611 00	59	680	680 00
Harvey.....	149	10,128	10,128 00	123	3,832	3,832 00
Haskell.....	1					
Hodgeman.....		336	336 00			
Jackson.....	62	1,249	1,249 00	75	1,407	1,407 00
Jefferson.....	67	1,372	1,372 00	41	820	820 00
Jewell.....	17	377	377 00	3	55	55 00
Johnson.....	206	2,358	2,358 00	134	1,544	1,544 00
Kearny.....		25	25 00			
Kingman.....	34	204	204 00	191	82	82 00
Kiowa.....	1	36	36 00	3		
Labette.....	28	158	158 00	30	122	122 00
Lane.....	11	132	132 00	4		
Leavenworth.....	274	20,084	20,084 00	207	23,683	23,683 00
Lincoln.....	47	3,053	3,053 00	18	987	987 00
Linn.....	6	30	30 00	9		
Logan.....		35	35 00	9		
Lyon.....	107	1,950	1,950 00	172	4,008	4,008 00
Marion.....	218	12,857	12,857 00	238	11,388	11,388 00
Marshall.....	120	229	229 00	107	1,331	1,331 00
McPherson.....	253	10,059	10,059 00	318	8,323	8,323 00
Meade.....	1	48	48 00	1	11	11 00
Miami.....		510	510 00	30	419	419 00
Mitchell.....	56	662	662 00	28	13	13 00
Montgomery.....	46	389	389 00	43	759	759 00
Morris.....	19	305	305 00	63	208	208 00
Morton.....						
Nemaha.....	120	4,312	4,312 00	115	5,720	5,720 00
Neosho.....	79	976	976 00	56	746	746 00
Ness.....	1	163	163 00			
Norton.....	36	213	213 00	1	7	7 00
Osage.....	139	2,135	2,135 00	231	3,900	3,900 00
Osborne.....	6	184	184 00	4	70	70 00
Ottawa.....	16	504	504 00	19	68	68 00
Pawnee.....	2	53	53 00	16	20	20 00
Phillips.....	2	974	974 00	2	583	583 00
Pottawatomie.....	126	8,080	8,080 00	144	10,841	10,841 00
Pratt.....	12	233	233 00	16	2	2 00
Rawlins.....	3	28	28 00	2	223	223 00
Reno.....	267	6,362	6,362 00	301	3,466	3,466 00
Republic.....	43	389	389 00	92	50	50 00
Rice.....	52	187	187 00	72	390	390 00
Riley.....	86	1,628	1,628 00	73	1,026	1,026 00
Rooks.....	1	132	132 00			
Rush.....		7	7 00	2		
Russell.....	2	123	123 00			
Saline.....	79	1,739	1,739 00	76	1,408	1,408 00
Scott.....		5	5 00			
Sedgwick.....	395	10,921	10,921 00	445	8,929	8,929 00
Seward.....				7		
Shawnee.....	220	669	669 00	225	2,609	2,609 00
Sheridan.....		95	95 00	1	9	9 00
Sherman.....						
Smith.....	1	188	188 00	1	30	30 00
Stafford.....	27	175	175 00	18	61	61 00
Stanton.....	2					
Stevens.....		3	3 00			
Sumner.....	162	597	597 00	138	1,094	1,094 00
Thomas.....		1	1 00			
Trego.....	7	61	61 00	1	5	5 00
Wabaunsee.....	118	4,649	4,649 00	134	3,922	3,922 00
Wallace.....						
Washington.....	230	2,416	2,416 00	148	504	504 00
Wichita.....				4		
Wilson.....	11	193	193 00	14	176	176 00
Woodson.....	16	72	72 00	12	251	251 00
Wyandotte.....	364	4,752	4,752 00	434	4,103	4,103 00
Totals.....	6,902	225,796	\$225,796 00	6,843	174,026	\$174,026 00

APIACULTURE, 1893.

TABLE showing number of stands of bees, and number of pounds and value of honey and wax produced, in the year 1893.

COUNTIES.	Number stands of bees.	Pounds of honey produced.	Pounds of wax produced.	Value of honey and wax.
Allen.....	859	5,827	228	\$1,105 86
Anderson.....	984	8,213	60	1,493 34
Atchison.....	1,211	13,472	236	2,483 96
Barber.....	27	300	2	54 50
Barton.....	10	1,000	.....	180 00
Bourbon.....	2,569	14,493	160	2,648 74
Brown.....	2,404	17,976	105	3,261 93
Butler.....	688	9,517	176	1,757 06
Chase.....	301	3,257	24	592 26
Chautauqua.....	608	5,495	81	1,009 35
Cherokee.....	2,188	17,090	101	3,101 45
Cheyenne.....	11	.....	.....	.....
Clark.....	.....	.....	.....	.....
Clay.....	768	12,612	65	2,286 41
Cloud.....	789	10,876	17	1,961 93
Coffey.....	861	10,152	12	1,830 36
Comanche.....	.....	.....	.....	.....
Cowley.....	843	6,841	16	1,235 38
Crawford.....	1,588	15,595	178	2,851 60
Decatur.....	2	.....	.....	.....
Dickinson.....	371	2,802	5	505 61
Doniphan.....	956	7,850	42	1,423 50
Douglas.....	1,503	6,391	20	1,155 38
Edwards.....	.....	.....	.....	.....
Elk.....	915	6,210	95	1,141 55
Ellis.....	16	.....	.....	.....
Ellsworth.....	.....	.....	.....	.....
Finnery.....	110	3,870	75	715 35
Ford.....	.....	.....	.....	.....
Franklin.....	1,762	13,714	28	2,475 52
Geary.....	201	2,944	4	530 92
Gove.....	.....	.....	.....	.....
Graham.....	1	22	.....	3 96
Grant.....	.....	.....	.....	.....
Gray.....	.....	.....	.....	.....
Greeley.....	.....	.....	.....	.....
Greenwood.....	441	4,613	4	831 34
Hamilton.....	11	.....	.....	.....
Harper.....	3	25	.....	4 50
Harvey.....	202	690	.....	124 20
Haskell.....	.....	.....	.....	.....
Hodgeman.....	.....	.....	.....	.....
Jackson.....	891	7,697	51	1,398 21
Jefferson.....	917	3,522	30	641 46
Jewell.....	1,198	16,696	.....	3,005 28
Johnson.....	1,253	5,470	20	889 60
Kearny.....	9	370	5	67 85
Kingman.....	3	.....	.....	.....
Kiowa.....	.....	.....	.....	.....
Labette.....	1,715	12,456	56	2,256 08
Lane.....	.....	.....	.....	.....
Leavenworth.....	1,683	13,903	322	2,583 04
Lincoln.....	11	100	.....	18 00
Linn.....	555	3,123	32	570 14
Logan.....	.....	.....	.....	.....
Lyon.....	1,123	10,434	240	1,938 12
Marion.....	174	1,068	27	198 99
Marshall.....	1,011	3,561	9	643 23
McPherson.....	44	558	2	100 94
Meade.....	1	.....	.....	.....
Miami.....	1,312	9,952	530	1,923 86
Mitchell.....	385	5,503	6	992 04
Montgomery.....	964	7,845	255	1,475 85
Morris.....	318	4,494	10	811 42
Morton.....	.....	.....	.....	.....
Nemaha.....	1,165	12,728	54	2,304 54
Neosho.....	1,408	12,259	67	2,223 37
Ness.....	.....	.....	.....	.....
Norton.....	89	1,405	1	253 15
Osage.....	1,313	13,059	64	2,366 62
Osborne.....	51	650	.....	117 00
Ottawa.....	248	1,010	10	184 30
Pawnee.....	17	80	.....	14 40
Phillips.....	19	541	.....	97 38
Pottawatomie.....	704	6,044	82	1,108 42

APIACULTURE, 1893—CONCLUDED.

COUNTIES.	Number stands of bees.	Pounds of honey produced.	Pounds of wax produced.	Value of honey and wax.
Pratt.....				
Rawlins.....	2	160		\$28 80
Reno.....	2			
Republic.....	1,028	13,248	39	2,394 39
Rice.....	2	25		4 50
Riley.....	975	16,155	287	2,979 65
Rooks.....	4			
Rush.....	3			
Russell.....				
Saline.....	269	3,759	32	684 62
Scott.....				
Sedgwick.....	625	6,041	158	1,126 88
Seward.....				
Shawnee.....	667	2,431	297	511 83
Sheridan.....				
Sherman.....				
Smith.....	117	1,794	5	324 17
Stafford.....	2			
Stanton.....				
Stevens.....				
Sumner.....	338	3,975	25	721 75
Thomas.....	6	200		36 00
Trego.....				
Wabauensee.....	584	6,916	80	1,264 88
Wallace.....				
Washington.....	4,699	30,619	627	5,668 17
Wichita.....				
Wilson.....	964	13,904	32	2,510 72
Woodson.....	491	6,012	51	1,094 91
Wyandotte.....	397	2,001	88	382 18
Totals.....	52,959	463,615	5,328	\$84,782 70

APIACULTURE, 1894.

TABLE showing number of stands of bees, and number of pounds and value of honey and wax produced, in the year 1894.

COUNTIES.	Number stands of bees.	Pounds of honey produced.	Pounds of wax produced.	Value of honey and wax.
Allen.....	782	1,764		\$317 52
Anderson.....	886	4,360	315	847 80
Atchison.....	872	4,125	125	767 50
Barber.....	6	25		4 50
Barton.....	12	200		36 00
Bourbon.....	1,773	6,344	87	1,159 32
Brown.....	1,830	14,242	150	2,593 56
Butler.....	572	1,324	168	271 92
Chase.....	286	3,154	60	579 72
Chautauqua.....	402	1,799	64	336 62
Cherokee.....	1,265	4,112	19	743 96
Cheyenne.....	4			
Clark.....				
Clay.....	721	6,985	12	1,259 70
Cloud.....	756	8,967		1,614 06
Coffey.....	849	8,649	39	1,564 62
Comanche.....				
Cowley.....	573	958		172 44
Crawford.....	833	2,902	34	529 16
Decatur.....	2	100		18 00
Dickinson.....	581	12,753	12	2,297 94
Doniphan.....	1,014	6,740	377	1,288 60
Douglas.....	1,090	3,405		612 90
Edwards.....				
Elk.....	598	2,461	47	452 38
Ellis.....				
Ellsworth.....		89	8	17 62
Finney.....	85	2,756		496 08
Ford.....				
Franklin.....	1,541	14,476	406	2,687 42

APIACULTURE, 1894—CONCLUDED.

COUNTIES.	Number stands of bees.	Pounds of honey produced.	Pounds of wax produced.	Value of honey and wax.
Geary.....	239	2,383	115	\$451 94
Gove.....				
Graham.....	1	40		7 20
Grant.....				
Gray.....				
Greeley.....				
Greenwood.....	384	1,874	97	356 72
Hamilton.....	25	1,000	50	190 00
Harper.....				
Harvey.....	67	236	11	44 68
Haskell.....				
Hodgeman.....				
Jackson.....	864	8,160	88	1,486 40
Jefferson.....	580	3,850	25	698 00
Jewell.....	768	2,828	8	510 64
Johnson.....	535	1,685	115	326 30
Kearny.....	6	50		9 00
Kingman.....	2			
Kiowa.....				
Labette.....	1,116	2,914	112	546 92
Lane.....				
Leavenworth.....	1,398	5,569	75	1,017 42
Lincoln.....	12	24		4 32
Linn.....	635	3,241	25	588 38
Logan.....				
Lyon.....	1,052	7,657	173	1,412 86
Marion.....	116	243		43 74
Marshall.....	1,628	13,430	29	2,423 20
McPherson.....	47	296		53 28
Meade.....				
Miami.....	1,285	5,442	200	1,019 56
Mitchell.....	457	3,993	15	721 74
Montgomery.....	873	3,276	116	612 88
Morris.....	352	3,255	6	587 10
Morton.....				
Nemaha.....	1,239	16,005	68	2,894 50
Neosho.....	1,178	9,555	141	1,748 10
Ness.....				
Norton.....	66	1,408		253 44
Osage.....	1,356	15,136	50	2,734 48
Osborne.....	41	360		64 80
Ottawa.....	283	1,645	14	299 90
Pawnee.....	5	200		36 00
Phillips.....	44	325		57 50
Pottawatomie.....	711	7,827	60	1,408 86
Pratt.....	1			12 00
Rawlins.....	10	130		23 40
Reno.....				
Republic.....	579	1,543	18	281 34
Rice.....				
Riley.....	922	12,867	341	2,384 26
Rooks.....	6	55		9 90
Rush.....				
Russell.....				
Saline.....	344	7,322	44	1,326 76
Scott.....				
Sedgwick.....	331	1,315		236 70
Seward.....				
Shawnee.....	663	5,191	15	937 38
Sheridan.....				
Sherman.....				
Smith.....	89	284		51 12
Stafford.....				
Stanton.....				
Stevens.....				
Sumner.....	223	175		31 50
Thomas.....	1	20	5	4 60
Trego.....				
Wabaunsee.....	575	8,449	6	1,522 02
Wallace.....				
Washington.....	1,472	11,214	114	2,041 32
Wichita.....				
Wilson.....	1,017	5,820	42	1,056 00
Woodson.....	465	3,209	75	592 62
Wyandotte.....	180	992		178 56
Totals.....	41,576	295,186	4,176	\$53,968 68

ARTIFICIAL FOREST, 1893.

TABLE showing number of acres of trees one year old and over.

COUNTIES.	Walnut.	Maple.	Honey locust.	Cotton-wood.	Other varieties.
Allen.....	49	197	.....	63	2,095
Anderson.....	15	75	1	9	1,025
Atchison.....	229	749	8	75	2,680
Barber.....	314	85	40	376	1,396
Barton.....	87	13	52	484	1,151
Bourbon.....	2,774	4,099	100	1	2,930
Brown.....	95	244	31	384	4,472
Butler.....	90	64	19	390	1,942
Chase.....	56	28	2	85	124
Chautauqua.....	51	56	3	23	5,173
Cherokee.....	17	139	2	6	319
Cheyenne.....	49	17	25	195	871
Clark.....	1	.....	2	60	7
Clay.....	1,206	454	24	1,789	2,204
Cloud.....	100	50	8	796	2,900
Coffey.....	25	39	2	10	756
Comanche.....	13	2	5	261	42
Cowley.....	81	183	2	305	882
Crawford.....	22	68	8	3	642
Decatur.....	385	39	20	152	1,348
Dickinson.....	144	110	18	555	1,691
Doniphan.....	66	100	5	247	5,419
Douglas.....	230	104	7	.....	2,625
Edwards.....	65	13	137	929	338
Elk.....	53	199	5	37	119
Ellis.....	58	4	138	148	381
Ellsworth.....	60	27	78	132	1,038
Finney.....	15	5	44	267	125
Ford.....	35	20	278	203	456
Franklin.....	21	56	1	20	3,128
Geary.....	39	49	1	66	141
Gove.....	9	1	16	72	282
Graham.....	129	2	22	178	1,042
Grant.....	11	1	20	167	97
Gray.....	9	.....	23	226	175
Greeley.....	24	.....	2	8	72
Greenwood.....	62	90	.....	40	396
Hamilton.....	33	5	65	445	111
Harper.....	70	84	49	769	741
Harvey.....	111	83	19	1,076	831
Haskell.....	17	2	13	180	70
Hodgeman.....	80	16	76	12	527
Jackson.....	51	128	4	70	5,071
Jefferson.....	342	70	.....	7	10,672
Jewell.....	166	83	22	622	2,046
Johnson.....	63	53	2	14	1,971
Kearny.....	39	1	48	114	117
Kingman.....	34	29	29	1,035	384
Kiowa.....	2	2	12	124	57
Labette.....	48	149	.....	19	1,660
Lane.....	1	2	102	191	299
Leavenworth.....	458	32	.....	74	9,957
Lincoln.....	121	10	56	245	965
Linn.....	176	66	2	6	256
Logan.....	21	2	51	56	284
Lyon.....	18	62	.....	37	27
Marion.....	117	29	13	335	1,576
Marshall.....	41	257	8	77	241
McPherson.....	233	169	7	1,461	2,173
Meade.....	79	6	199	722	328
Miami.....	7	5	.....	.....	.....
Mitchell.....	164	6	655	389	1,575
Montgomery.....	30	102	1	26	3,318
Morris.....	22	27	2	49	1,144
Morton.....	4	.....	17	96	57
Nemaha.....	99	147	5	122	1,579
Neosho.....	46	639	1	30	2,944
Ness.....	154	2	155	82	676
Norton.....	202	24	33	182	1,343
Osage.....	156	751	22	711	2,637
Osborne.....	205	21	68	211	1,063
Ottawa.....	123	1,448	7	1,113	781
Pawnee.....	79	2	35	362	398
Phillips.....	315	4	35	169	969
Pottawatomie.....	82	412	.....	136	1,485
Pratt.....	96	8	9	391	416
Rawlins.....	93	11	43	217	2,020

ARTIFICIAL FOREST, 1893—CONCLUDED—Trees one year old and over.

COUNTIES.	Walnut.	Maple.	Honey locust.	Cotton-wood.	Other varieties.
Reno.....	351	108	132	2,993	3,000
Republic.....	76	468	9	1,562	2,374
Rice.....	173	59	40	839	1,456
Riley.....	71	136	3	153	553
Rooks.....	299	10	118	307	1,325
Rush.....	131	45	121	34	1,109
Russell.....	100	10	84	60	375
Saline.....	156	58	48	309	2,778
Scott.....	4	.....	18	64	116
Sedgwick.....	170	95	36	1,460	2,098
Seward.....	6	9	36	132	70
Shawnee.....	3	4	695	1	8
Sheridan.....	26	.....	14	63	909
Sherman.....	12	9	1	119	563
Smith.....	523	40	38	251	1,688
Stafford.....	137	131	69	3,546	862
Stanton.....	51	11	8	179	175
Stevens.....	26	.....	5	163	162
Sumner.....	224	144	46	1,464	1,140
Thomas.....	66	11	67	265	1,276
Trego.....	26	6	139	83	621
Wabaunsee.....	55	71	12	81	1,085
Wallace.....	10	.....	315	.....	232
Washington.....	133	204	11	566	4,917
Wichita.....	4	7	33	42	58
Wilson.....	18	51	.....	3	1,353
Woodson.....	10	102	.....	4	710
Wyandotte.....	381	6	10	.....	2,078
Totals.....	14,129	14,125	5,122	35,481	146,344

ARTIFICIAL FOREST, 1894—Trees one year old and over.

COUNTIES.	Walnut.	Maple.	Honey locust.	Cotton-wood.	Other varieties.
Allen.....	152	219	.....	7	2,357
Anderson.....	18	155	1	3	1,312
Atchison.....	109	142	5	70	2,452
Barber.....	139	6	25	475	1,890
Barton.....	105	86	62	493	799
Bourbon.....	5,418	2,515	.....	1	3,549
Brown.....	162	222	27	339	4,620
Butler.....	497	102	21	360	5,459
Chase.....	61	15	1	42	761
Chautauqua.....	48	92	2	20	4,540
Cherokee.....	5	87	.....	1	899
Cheyenne.....	21	6	7	147	951
Clark.....	.....	.....	.....	98	16
Clay.....	103	261	3	562	1,835
Cloud.....	93	21	1	482	2,219
Coffey.....	18	46	1	5	79
Comanche.....	23	12	9	131	98
Cowley.....	76	156	2	264	1,294
Crawford.....	46	37	2	3	316
Decatur.....	153	32	45	35	1,477
Dickinson.....	180	111	7	515	1,847
Doniphan.....	57	99	13	179	1,913
Douglas.....	137	117	104	1	1,378
Edwards.....	49	14	411	962	464
Elk.....	162	206	.....	52	1,468
Ellis.....	64	7	282	96	566
Ellsworth.....	63	25	77	162	1,162
Finney.....	15	3	49	283	127
Ford.....	37	16	551	176	401
Franklin.....	50	39	5	6	2,036
Geary.....	48	40	3	58	768
Gove.....	4	36	9	23	161
Graham.....	81	7	53	120	843
Grant.....	8	3	22	52	83
Gray.....	11	.....	15	742	54

ARTIFICIAL FOREST, 1894—CONCLUDED—Trees one year old and over.

COUNTIES.	Walnut.	Maple.	Honey locust.	Cotton-wood.	Other varieties..
Greeley.....	20	.....	2	19	11
Greenwood.....	37	69	3	20	1,806
Hamilton.....	7	.....	28	188	85
Harper.....	50	73	79	688	629
Harvey.....	121	101	5	1,177	530
Haskell.....	5	.....	42	47	26
Hodgeman.....	107	.....	596	27	296
Jackson.....	65	132	6	26	4,010
Jefferson.....	165	102	14	11	12
Jewell.....	69	35	10	510	2,610
Johnson.....	227	106	2	16	1,629
Kearny.....	3	.....	23	54	91
Kingman.....	27	28	21	972	440
Kiowa.....	8	4	14	155	52
Labette.....	70	158	1	14	2,804
Lane.....	11	2	13	66	156
Leavenworth.....	386	26	2	2	14,640
Lincoln.....	52	101	16	278	457
Linn.....	176	161	4	15	72
Logan.....	5	1	22	43	301
Lyon.....	144	23	8	43	587
Marion.....	70	58	16	348	1,458
Marshall.....	40	296	7	297	2,832
McPherson.....	254	348	36	1,353	1,845
Meade.....	92	5	62	558	254
Miami.....	37	61	1	7	3
Mitchell.....	134	30	40	293	1,714
Montgomery.....	33	90	.....	2	3,542
Morris.....	21	55	822	121	500
Morton.....	1	.....	.....	56	41
Nemaha.....	103	123	251	174	2,327
Neosho.....	30	94	.....	7	1,235
Ness.....	104	2	97	84	486
Norton.....	177	37	36	169	1,813
Osage.....	262	100	12	88	1,168
Osborne.....	727	72	61	147	1,000
Ottawa.....	100	72	4	462	1,195
Pawnee.....	57	4	71	295	398
Phillips.....	199	9	38	139	828
Pottawatomie.....	49	139	6	79	401
Pratt.....	63	8	19	395	359
Rawlins.....	16	12	62	65	1,942
Reno.....	432	218	304	3,236	2,253
Republic.....	216	152	16	630	2,790
Rice.....	180	311	112	1,019	1,165
Riley.....	52	71	2	76	1,315
Rooks.....	195	11	94	120	1,110
Rush.....	99	6	121	34	428
Russell.....	64	.....	35	37	507
Saline.....	1,211	36	23	903	1,670
Scott.....	4	.....	23	71	128
Sedgwick.....	116	94	17	1,443	1,923
Seward.....	1	1	20	48	48
Shawnee.....	9	13	.....	4	42
Sheridan.....	24	2	5	102	547
Sherman.....	15	5	16	66	580
Smith.....	363	34	24	234	2,396
Stafford.....	212	42	98	1,678	819
Stanton.....	2	.....	8	34	61
Stevens.....	23	5	2	199	87
Sumner.....	133	90	38	1,412	1,208
Thomas.....	99	16	35	114	1,005
Trego.....	25	4	106	57	762
Wabaunsee.....	49	67	32	57	942
Wallace.....	33	2	13	201	94
Washington.....	67	196	21	408	3,763
Wichita.....	8	10	27	30	70
Wilson.....	24	75	2	4	3,291
Woodson.....	14	138	.....	22	929
Wyandotte.....	.....	.....	.....	.....	1,901
Totals.....	16,197	9,271	5,561	28,714	138,613

STATE SUMMARY, 1893.

SHOWING the total acreage, quantity and value of farm products.

CROPS.	Acres.	Quantities.	Value.
Winter wheat.....bu.	4,909,972	24,634,414	\$10,954,110 96
Spring wheat.....bu.	200,901	193,109	78,821 08
Corn.....bu.	6,172,462	118,624,369	32,621,762 62
Oats.....bu.	1,758,127	28,194,717	6,488,342 03
Rye.....bu.	198,717	1,063,019	410,809 08
Barley.....bu.	201,378	467,882	171,875 83
Buckwheat.....bu.	1,687	12,378	9,283 50
Irish potatoes.....bu.	80,817	4,217,119	2,951,587 30
Sweet potatoes.....bu.	3,808	313,088	313,088 00
Castor beans.....bu.	4,612	28,745	33,056 75
Sorghum.....	172,893	.....	* 1,699,990 00
Cotton.....lbs.	328	33,800	2,366 00
Flax.....bu.	105,364	762,409	648,047 65
Tobacco.....lbs.	370	24,000	2,400 00
Broom corn.....lbs.	128,695	49,818,823	1,235,541 18
Millet and hungarian.....tons	267,006	457,240	1,913,338 00
Milo maize.....tons	14,004	34,670	121,345 00
Kaffir corn.....tons	46,911	128,857	450,998 00
Jerusalem corn.....tons	17,027	26,962	80,886 00
Timothy.....	577,343	} 580,544	3,483,264 00
Clover.....	83,346		
Blue grass.....	126,927		
Alfalfa.....	75,200		
Orchard grass.....	6,021		
Other tame grasses.....	53,259	} 1,521,106	5,775,606 75
Prairie grass, fenced..... tons	4,750,207		
Totals.....	19,957,382	.....	\$69,446,519 73
Wool clip.....lbs.	1,142,636	.....	\$182,821 76
Cheese.....lbs.	365,961	.....	440,255 71
Butter.....lbs.	27,347,613	.....	4,375,618 08
Animals slaughtered and sold for slaughter.....	.....	.....	42,774,761 00
Milk sold other than that sold for butter and cheese.....	.....	.....	430,865 00
Poultry and eggs sold.....	.....	.....	3,421,296 00
Garden products marketed.....	.....	.....	808,487 00
Horticultural products marketed.....	.....	.....	609,192 00
Wine manufactured.....gals.	225,796	.....	225,796 00
Honey and wax produced.....lbs.	463,615	.....	84,782 70
Wood marketed.....	.....	.....	170,170 00
Totals.....	.....	.....	\$53,124,045 25
Grand total.....	.....	.....	\$122,570,564 98

*Syrup and forage.

†Quantity estimated in tons in 1893.

LIVE STOCK.

SHOWING numbers as returned by assessors, and values, for the year 1893.

ANIMALS.	Number.	Value.
Horses.....	860,186	\$44,729,672 00
Mules and asses.....	88,585	5,492,270 00
Milch cows.....	567,353	11,347,060 00
Other cattle.....	1,505,273	25,589,641 00
Sheep.....	224,952	562,380 00
Swine.....	1,406,086	10,545,645 00
Total.....	.....	\$98,266,668 00

STATE SUMMARY, 1894.

SHOWING the total acreage, quantity and value of farm products.

CROPS.	Acres.	Quantities.	Value.
Winter wheat.....bu.	4,675,704	28,175,656	\$11,285,804 80
Spring wheat.....bu.	165,188	30,044	11,992 33
Corn.....bu.	6,404,705	66,952,833	25,354,190 27
Oats.....bu.	1,427,444	18,385,469	5,071,543 74
Rye.....bu.	131,134	978,658	404,982 98
Barley.....bu.	111,390	582,393	232,509 01
Buckwheat.....bu.	1,335	10,680	6,408 00
Irish potatoes.....bu.	100,610	4,995,181	3,123,993 69
Sweet potatoes.....bu.	4,437	326,974	195,189 18
Castor beans.....bu.	4,679	40,338	40,338 00
Sorghum.....	221,524		* 1,975,914 80
Cotton.....lbs.	89	6,400	384 00
Flax.....bu.	127,542	1,043,418	1,043,418 00
Tobacco.....lbs.	243	178,300	17,830 00
Broom corn.....lbs.	86,718	15,967,655	510,370 46
Millet and hungarian.....tons	323,153	421,606	1,737,018 00
Milo maize.....bu.	8,720	† 110,070	49,531 50
Kafir corn.....bu.	95,237	† 1,258,912	629,456 00
Jerusalem corn.....bu.	20,118	† 268,337	134,168 50
Timothy.....tons	536,134		
Clover.....tons	66,474		
Blue grass.....tons	129,485	598,857	3,593,142 00
Alfalfa.....tons	90,825		
Orchard grass.....tons	3,352		
Other tame grasses.....tons	62,323		
Prairie grass, fenced.....tons	4,867,720	1,431,346	5,735,948 00
Totals.....	19,666,283		\$61,154,139 26
Wool clip.....lbs.		959,452	\$124,728 76
Cheese.....lbs.		320,763	38,491 56
Butter.....lbs.		27,412,211	4,385,953 76
Animals slaughtered and sold for slaughter.....			42,069,703 00
Milk sold.....			446,036 00
Poultry and eggs sold.....			3,643,801 00
Garden products marketed.....			757,958 00
Horticultural products.....			377,225 00
Wine manufactured.....gals.		174,026	174,026 00
Honey and beeswax.....lbs.		299,362	53,968 68
Wood marketed.....			129,865 00
Totals.....			\$52,201,756 76
Grand total.....			\$113,355,896 02

* Syrup and forage.

† Quantity estimated in bushels in 1894.

LIVE STOCK.

SHOWING numbers as returned by assessors March 1, and values for the year 1894.

ANIMALS.	Number.	Value.
Horses.....	864,651	\$28,533,483 00
Mules and asses.....	86,729	3,642,618 00
Milch cows.....	524,127	11,530,794 00
Other cattle.....	1,291,793	23,252,274 00
Sheep.....	166,384	415,960 00
Swine.....	1,623,375	11,363,625 00
Total.....		\$78,738,754 00

STATE SUMMARY.—1885 TO 1894, INCLUSIVE.

SHOWING acres, product and value of field crops for the years named.

1885.	Acres.	Product.	Value.
Winter wheat.....bu.	1,999,723	9,784,395	\$6,222,934
Spring wheat.....bu.	90,826	987,786	607,011
Corn.....bu.	5,266,034	177,350,703	40,428,327
Rye.....bu.	187,493	2,728,304	1,047,496
Barley.....bu.	41,720	895,426	260,056
Oats.....bu.	905,372	31,561,490	6,558,303
Buckwheat.....bu.	1,661	23,349	18,740
Irish potatoes.....bu.	81,171	6,983,915	3,947,431
Sweet potatoes.....bu.	3,295	299,435	268,304
Sorghum.....bu.	79,223	.....	1,787,045
Castor beans.....bu.	23,135	181,094	264,222
Cotton.....lbs.	692	193,760	15,500
Flax.....bu.	122,199	819,949	769,776
Hemp.....lbs.	232	208,800	10,440
Tobacco.....lbs.	535	428,000	42,800
Broom corn.....lbs.	28,432	17,095,200	650,794
Millet and hungarian.....tons	582,988	1,554,941	6,570,694
Timothy.....tons	286,846	1,010,516	5,111,389
Clover.....tons	113,003		
Orchard grass.....tons	17,628		
Blue grass.....tons	63,132		
Other tame grasses.....tons	24,644	2,619,893	8,844,930
Prairie, under fence.....tons	4,306,943		
Totals.....	14,226,987	.....	\$83,426,192
1886.			
Winter wheat.....bu.	1,674,890	13,580,592	\$7,961,946
Spring wheat.....bu.	63,503	990,441	520,557
Corn.....bu.	5,802,018	139,569,132	37,966,031
Rye.....bu.	164,819	2,525,385	1,004,480
Barley.....bu.	34,100	728,368	214,497
Oats.....bu.	1,178,642	35,777,365	8,860,603
Buckwheat.....bu.	2,110	33,213	23,665
Irish potatoes.....bu.	99,394	2,274,765	4,402,305
Sweet potatoes.....bu.	3,585	358,500	358,500
Sorghum.....bu.	68,554	.....	1,459,043
Castor beans.....bu.	30,641	306,410	450,615
Cotton.....lbs.	682	204,600	16,368
Flax.....bu.	87,904	879,040	791,136
Hemp.....lbs.	158	110,600	5,530
Tobacco.....lbs.	409	245,400	24,540
Broom corn.....lbs.	68,399	38,633,500	1,352,172
Millet and hungarian.....tons	570,600	1,141,200	4,873,890
Timothy.....tons	418,176	1,100,580	6,387,751
Clover.....tons	129,235		
Orchard grass.....tons	21,930		
Blue grass.....tons	69,582		
Other tame grasses.....tons	51,402	2,723,451	10,893,804
Prairie, under fence.....tons	4,010,400		
Totals.....	14,571,133	.....	\$87,576,433
1887.			
Winter wheat.....bu.	75,296	662,257	\$406,886
Spring wheat.....bu.	1,298,619	8,616,244	5,352,562
Corn.....bu.	6,530,392	75,791,454	26,836,422
Rye.....bu.	153,472	1,926,335	820,108
Barley.....bu.	20,727	414,540	165,816
Oats.....bu.	1,577,076	46,727,418	12,232,243
Buckwheat.....bu.	4,229	63,435	47,576
Irish potatoes.....bu.	114,728	9,178,240	6,883,680
Sweet potatoes.....bu.	5,016	501,600	419,745
Sorghum.....bu.	96,432	.....	1,794,505
Castor beans.....bu.	43,342	405,488	364,939
Cotton.....lbs.	1,639	409,750	32,780
Flax.....bu.	142,577	1,400,741	1,190,629
Hemp.....lbs.	327	228,900	11,445
Tobacco.....lbs.	740	444,000	44,400
Broom corn.....lbs.	70,111	42,066,600	1,472,331
Millet and hungarian.....tons	508,441	1,016,882	4,764,901
Timothy.....tons	464,496	410,894	2,460,774
Clover.....tons	129,377		
Orchard grass.....tons	17,378		
Blue grass.....tons	81,628		
Other tame grasses.....tons	54,182	2,381,964	9,948,764
Prairie, under fence.....tons	3,805,861		
Totals.....	15,196,086	.....	\$75,250,556

STATE SUMMARY — CONTINUED — Field crops.

1888.	Acres.	Product.	Value.
Winter wheat.....bu.	41,176	589,597	\$346,817
Spring wheat.....bu.	1,078,943	16,135,120	11,750,996
Corn.....bu.	6,993,207	168,754,087	52,395,948
Rye.....bu.	191,677	3,199,110	1,350,759
Barley.....bu.	5,727	113,585	40,325
Oats.....bu.	1,656,814	54,665,055	12,470,908
Buckwheat.....bu.	3,824	49,984	40,298
Irish potatoes.....bu.	126,185	8,199,004	5,234,356
Sweet potatoes.....bu.	7,272	670,878	670,878
Sorghum.....bu.	206,923	.....	3,106,188
Castor beans.....bu.	14,778	122,502	122,502
Cotton.....lbs.	2,150	645,000	51,600
Flax.....bu.	162,655	1,340,222	1,206,199
Hemp.....lbs.	239	167,300	8,365
Tobacco.....lbs.	559	335,400	33,540
Broom corn.....lbs.	52,054	27,385,800	958,503
Millet and hungarian.....tons	471,539	943,078	3,997,517
Timothy.....bu.	458,023	.....	.....
Clover.....bu.	100,166	.....	.....
Orchard grass.....tons	12,157	387,812	2,326,872
Blue grass.....bu.	73,874	.....	.....
Other tame grasses.....bu.	55,465	.....	.....
Prairie, under fence.....tons	3,861,681	2,188,767	7,748,377
Totals.....	15,557,088	.....	\$103,860,948
1889.			
Winter wheat.....bu.	1,505,947	34,130,048	\$19,329,574
Spring wheat.....bu.	88,338	1,189,803	588,127
Corn.....bu.	6,820,603	273,888,321	51,649,876
Oats.....bu.	1,689,801	47,922,889	7,654,812
Rye.....bu.	294,626	5,850,080	1,536,998
Barley.....bu.	6,373	175,405	47,829
Buckwheat.....bu.	4,388	69,990	41,994
Irish potatoes.....bu.	109,447	11,432,482	3,892,229
Sweet potatoes.....bu.	6,615	779,783	412,266
Sorghum.....bu.	324,593	.....	4,217,757
Castor beans.....bu.	21,158	187,520	240,835
Cotton.....lbs.	1,393	511,900	40,952
Flax.....bu.	113,329	1,200,305	1,200,305
Hemp.....lbs.	248	173,600	8,680
Tobacco.....lbs.	699	419,400	41,940
Broom corn.....lbs.	39,583	23,749,800	831,243
Millet and hungarian.....tons	431,714	863,428	3,453,712
Timothy.....bu.	487,425	.....	.....
Clover.....bu.	132,591	.....	.....
Orchard grass.....tons	10,003	395,967	1,583,868
Blue grass.....bu.	94,586	.....	.....
Other tame grasses.....bu.	51,718	.....	.....
Prairie, under fence.....tons	4,838,908	2,456,984	7,370,952
Totals.....	17,074,186	.....	\$104,143,949
1890.			
Winter wheat.....bu.	2,144,065	27,940,401	\$22,819,415
Spring wheat.....bu.	177,048	860,813	591,133
Corn.....bu.	5,775,691	51,090,229	21,491,916
Oats.....bu.	1,227,371	29,175,582	9,174,400
Rye.....bu.	202,363	2,274,879	1,136,463
Barley.....bu.	18,067	247,918	123,959
Buckwheat.....bu.	4,054	42,988	42,988
Irish potatoes.....bu.	91,381	2,817,288	3,152,514
Sweet potatoes.....bu.	4,128	243,147	243,147
Sorghum.....bu.	216,714	.....	2,355,854
Castor beans.....bu.	39,101	302,677	378,350
Cotton.....lbs.	1,473	589,200	47,136
Flax.....bu.	228,859	2,173,800	2,717,263
Hemp.....lbs.	105	73,500	3,675
Tobacco.....lbs.	404	242,400	24,240
Broom corn.....lbs.	67,222	24,665,100	739,953
Millet and hungarian.....tons	303,778	393,399	1,777,893
Timothy.....bu.	459,428	.....	.....
Clover.....bu.	164,163	.....	.....
Orchard grass.....tons	7,688	535,621	3,749,347
Blue grass.....bu.	84,616	.....	.....
Other tame grasses.....bu.	72,998	.....	.....
Prairie, under fence.....tons	4,638,957	2,175,352	8,674,821
Totals.....	15,929,654	.....	\$79,244,467

STATE SUMMARY—CONTINUED—Field crops.

1891.	Acres.	Product.	Value.
Winter wheat.....bu.	3,582,906	56,170,694	\$40,997,417 00
Spring wheat.....bu.	151,904	2,379,959	1,699,342 00
Corn.....bu.	5,209,234	139,363,991	48,057,979 00
Oats.....bu.	1,298,745	39,904,443	10,594,457 00
Rye.....bu.	332,673	5,443,030	3,528,680 00
Barley.....bu.	36,484	1,006,280	411,910 00
Buckwheat.....bu.	3,405	44,874	40,387 00
Irish potatoes.....bu.	69,542	5,483,900	2,689,637 00
Sweet potatoes.....bu.	3,939	404,442	343,776 00
Castor beans.....bu.	16,428	114,644	143,305 00
Sorghum.....	195,848	.....	2,060,423 00
Cotton.....lbs.	1,782	445,500	35,640 00
Flax.....bu.	388,184	2,049,055	1,639,244 00
Hemp.....lbs.	247	172,900	8,645 00
Tobacco.....lbs.	366	219,600	21,960 00
Broom corn.....lbs.	58,225	28,261,450	918,497 00
Millet and hungarian.....tons	308,093	633,405	2,533,620 00
Timothy.....	498,854	.....	.....
Clover.....	158,589	.....	.....
Blue grass.....	101,869	.....	.....
Alfalfa.....tons	34,384	401,640	2,008,200 00
Orchard grass.....	5,701	.....	.....
Other tame grasses.....	63,702	.....	.....
Prairie, under fence.....tons	4,997,886	1,369,945	4,062,547 00
Totals.....	17,518,090	.....	\$121,695,666 00
1892.			
Winter wheat.....bu.	3,820,013	70,035,980	\$38,534,426 00
Spring wheat.....bu.	309,816	4,502,926	2,157,335 00
Corn.....bu.	5,603,588	138,658,621	42,889,849 00
Oats.....bu.	1,559,049	43,722,484	11,140,224 00
Rye.....bu.	239,173	4,042,613	1,697,057 00
Barley.....bu.	138,226	3,842,954	1,407,983 00
Buckwheat.....bu.	4,818	62,808	47,106 00
Irish potatoes.....bu.	80,147	4,257,504	3,438,042 00
Sweet potatoes.....bu.	3,502	300,000	300,000 00
Castor beans.....bu.	11,087	81,987	102,483 00
Sorghum.....	169,105	.....	1,935,341 00
Cotton.....lbs.	666	145,300	10,171 00
Flax.....bu.	171,517	1,245,555	1,058,721 00
Hemp.....lbs.	47	32,900	1,645 00
Tobacco.....lbs.	371	222,600	22,260 00
Broom corn.....lbs.	75,398	34,016,950	1,105,550 00
Millet and hungarian.....tons	275,929	493,648	1,974,592 00
Timothy.....	576,315	.....	.....
Clover.....	127,994	.....	.....
Blue grass.....	114,027	.....	.....
Alfalfa.....tons	62,583	700,613	3,503,065 00
Orchard grass.....	5,232	.....	.....
Other tame grasses.....	56,440	.....	.....
Prairie, under fence.....tons	4,955,197	2,374,479	8,232,251 00
Totals.....	18,360,240	.....	\$119,588,101 00
1893.			
Winter wheat.....bu.	4,909,972	24,634,414	\$10,954,110 96
Spring wheat.....bu.	200,901	193,109	78,821 08
Corn.....bu.	6,172,464	118,624,369	32,621,762 62
Oats.....bu.	1,758,127	28,194,717	6,488,342 03
Rye.....bu.	198,717	1,063,019	410,809 08
Barley.....bu.	201,378	467,882	171,875 83
Buckwheat.....bu.	1,687	12,378	9,283 50
Irish potatoes.....bu.	80,817	4,217,118	2,951,587 30
Sweet potatoes.....bu.	3,808	313,088	313,088 00
Castor beans.....bu.	4,612	28,745	33,056 75
Sorghum.....	172,893	.....	1,699,990 00
Cotton.....lbs.	328	33,800	2,366 00
Flax.....bu.	105,364	762,409	648,047 65
Tobacco.....lbs.	370	24,000	2,400 00
Broom corn.....lbs.	128,695	49,818,823	1,235,541 18
Millet and hungarian.....tons	267,006	457,240	1,913,338 00
Milo maize.....tons	14,004	34,670	121,345 00
Kafir corn.....tons	46,911	128,857	450,998 00
Jerusalem corn.....tons	17,027	26,962	80,886 00
Timothy.....tons	577,343	.....	.....
Clover.....tons	83,346	.....	.....
Blue grass.....tons	126,927	.....	.....
Alfalfa.....tons	75,200	580,544	3,483,264 00
Orchard grass.....tons	6,021	.....	.....
Other tame grasses.....tons	53,259	.....	.....
Prairie, under fence.....tons	4,750,207	1,521,106	5,775,606 75
Totals.....	19,957,382	.....	\$69,446,519 73

STATE SUMMARY — CONCLUDED — Field crops.

1894.	Acres.	Product.	Value.
Winter wheat.....bu.	4,675,704	28,175,656	\$11,285,808 80
Spring wheat.....bu.	165,188	30,044	11,992 33
Corn.....bu.	6,404,705	66,952,833	25,354,190 27
Oats.....bu.	1,427,444	18,385,469	5,071,543 74
Rye.....bu.	131,134	978,658	404,982 98
Barley.....bu.	111,390	582,393	232,509 01
Buckwheat.....bu.	1,335	10,680	6,408 00
Irish potatoes.....bu.	100,610	4,995,181	3,123,993 69
Sweet potatoes.....bu.	4,437	326,974	195,189 18
Castor beans.....bu.	4,679	40,338	40,338 00
Sorghum.....	221,524	.....	1,975,914 80
Cotton.....lbs.	89	6,400	384 00
Flax.....bu.	127,542	1,043,418	1,043,418 00
Tobacco.....lbs.	243	178,300	17,830 00
Broom corn.....lbs.	86,718	15,967,655	510,376 46
Millet and hungarian.....tons	323,153	421,606	1,737,018 00
Milo maize.....bu.	8,720	110,070	49,531 50
Kaffir corn.....bu.	95,237	1,258,912	629,456 00
Jerusalem corn.....bu.	20,118	268,337	134,168 50
Timothy.....tons	536,134		
Clover.....tons	66,474		
Blue grass.....tons	129,485	598,857	3,593,142 00
Alfalfa.....tons	90,825		
Orchard grass.....tons	3,352		
Other tame grasses.....tons	62,323		
Prairie, under fence.....tons	4,867,720	1,431,346	5,735,948 00
Totals.....	19,666,283	.....	\$61,154,139 26

PROCEEDINGS

OF THE TWENTY-THIRD ANNUAL MEETING OF THE KANSAS STATE
BOARD OF AGRICULTURE, HELD IN REPRESENTATIVE HALL,
TOPEKA, JANUARY 10, 11, AND 12, 1894.

WEDNESDAY, JANUARY 10, 1894.

At 4 o'clock P. M. the President called the Board to order, and the clerk called the roll. A quorum was present.

Prayer was offered by the Rev. S. B. Alderson.

On motion, the President appointed Messrs. Wheeler, Shinn, Potter, Diesem and Glick as a Committee on Credentials, and Messrs. Finley, Stokes and Secretary Mohler as a Committee on Program.

Upon motion of Mr. Diesem, reading minutes of the last meeting was dispensed with.

The Secretary read his report, which was adopted, and ordered placed on file.

The Board adjourned until 7:30 P. M.

EVENING SESSION.

The Board convened at 7:30, pursuant to the adjournment; President Smith in the chair.

The clerk called the roll, and a quorum was present.

Mr. Glick presented the report of the Committee on Credentials, which was adopted.

On behalf of Governor Lewelling, Mr. W. S. Hanna delivered an address of welcome, which was responded to by President Smith on behalf of the Board. Papers were read by Messrs. Wheeler, Shinn, Fred. Wellhouse, and Secretary Mohler.

Adjourned until 9:30 A. M.

THURSDAY, JANUARY 11, 1894.

The Board met pursuant to adjournment, and the meeting was opened with prayer by Rev. S. B. Alderson. It then proceeded to the election of officers. Messrs. Howe, Ferguson and Warner were appointed tellers to receive and count the vote.

Thomas M. Potter, of Marion county, was placed in nomination by W. B. Sutton for the office of President of the Board, and, upon motion duly seconded, the rules were suspended, and the Secretary instructed to cast the unanimous vote of the board for Mr. Potter. It was accordingly done and Mr. Potter duly declared elected.

Mr. J. E. Hoagland, of Jackson county, was placed in nomination for the office of Vice President, and, upon motion duly seconded, the rules were suspended, and the Secretary instructed to cast the unanimous vote of the Board for Mr. Hoagland. It was accordingly done and Mr. Hoagland duly declared elected.

Mr. Samuel T. Howe, of Shawnee county, was placed in nomination for the office of Treasurer, and, upon motion duly seconded and carried, the rules were suspended, and the Secretary instructed to cast the unanimous vote of the Board for Mr. Howe. It was accordingly done and Mr. Howe duly declared elected.

The Board next proceeded to the election of a Secretary.

Mr. Martin Mohler, Mr. R. T. Stokes, Mr. F. D. Coburn, Mr. D. W. Kingsley and Mr. I. D. Graham were placed in nomination.

The Board proceeded to ballot, with the following result: Mr. Stokes received 12 votes; Mr. Mohler 24 votes; Mr. Kingsley 4 votes; Mr. Coburn 8 votes, and Mr. Graham 4 votes.

Fifty-two votes were cast, and 27 were necessary to a choice. There being no election, the Board proceeded to a second ballot, with the following result: Mr. Stokes received 16 votes; Mr. Mohler 23 votes; Mr. Coburn 12 votes, and Mr. Graham 1 vote.

There being no election, the Board proceeded to a third ballot, with the following result: Mr. Mohler received 19 votes; Mr. Stokes 17 votes; Mr. Coburn 14 votes, and blank 1 vote.

There being no election, the Board proceeded to a fourth ballot, with the following result: Mr. Mohler received 15 votes; Mr. Stokes 17 votes; Mr. Coburn 20 votes.

There being no election, the Board proceeded to a fifth ballot, with the following result: Mr. Stokes received 16 votes; Mr. Coburn 31 votes, and Mr. Mohler 5 votes.

Mr. Coburn having received a majority of all the votes cast, was duly declared elected Secretary of the Board.

Mr. Glick offered the following resolution, which was unanimously adopted:

Resolved, That in the retirement of the Hon. Martin Mohler from the office of its Secretary, the Board recognizes that in the conduct of his office he has shown great interest in and devotion to the cause of agriculture, and in parting with him we tender to him our sincere thanks for his faithful devotion to the great interests of our state and for the faithful performance of the duties of his office.

On motion of Mr. Sutton, duly seconded and carried, the chair appointed Messrs. Potter, Hoagland and Coburn to meet with committees of the swine and stock-breeders' associations, in the general interest of the several societies.

Adjourned until 1:30 P. M.

AFTERNOON SESSION.

Board convened pursuant to the adjournment, President Smith in the chair, and proceeded to the election of members.

Joshua Wheeler was nominated to succeed himself, and the Secretary was instructed to cast the unanimous vote of the Board for Mr. Wheeler, and he was accordingly declared elected.

A. W. Smith was put in nomination to succeed T. M. Potter, and the Secretary was instructed to cast the unanimous vote of the Board for Mr. Smith, and he was accordingly declared elected.

J. L. Finley was put in nomination to succeed himself, and the Secretary was instructed to cast the unanimous vote of the Board for Mr. Finley, and he was accordingly declared elected.

A. C. Shinn was put in nomination to succeed himself, and the Secretary was instructed to cast the entire vote of the Board for Mr. Shinn, and he was accordingly declared elected.

I. L. Diesem was put in nomination to succeed himself, and the Secretary was instructed to cast the unanimous vote of the Board for Mr. Diesem, and he was accordingly declared elected.

Upon motion of Mr. Potter, a vote of thanks was extended to Prof. Milton Whitney for his address.

Mr. Wheeler, from the special committee having in charge the resolution in relation to the use of a portion of the fund at the disposal of the board of regents of the state agricultural college for making experiments in the western part of the

state, reported said resolution back to the Board with the recommendation that it be adopted. It was as follows:

WHEREAS, There is now at the disposal of the board of regents of the state agricultural college the sum of \$15,000 annually, appropriated by the general government for experiments in agriculture: therefore,

Resolved, That we hereby request the said board to undertake, as soon as possible, practical experiments in agriculture by irrigation in the western third or belt of the state, and in the execution expend a sufficient sum to make said experiments thorough.

The report was adopted.

Adjourned until 7:30 P. M.

[The evening session, and those of the following day and evening, were occupied with addresses and discussions, and the Board adjourned on Friday evening.]

MEETING OF THE NEW BOARD.

OFFICE OF THE STATE BOARD OF AGRICULTURE,
January 13, 1894.

Roll called; quorum present.

Oath of office administered to the newly elected officers and members.

On motion, the President appointed as committee on printing, F. D. Coburn, Geo. W. Glick, and S. T. Howe.

The appointive officers of the Board for 1893 were continued.

On motion, the President appointed as Committee on Needed Legislation, Wm. B. Sutton, Geo. W. Glick, R. T. Stokes, A. C. Shinn, T. M. Potter, F. D. Coburn, I. L. Diesem, and T. A. Hubbard.

Adjourned.

PROCEEDINGS

OF THE TWENTY-FOURTH ANNUAL MEETING OF THE KANSAS STATE
BOARD OF AGRICULTURE, HELD IN REPRESENTATIVE HALL,
TOPEKA, JANUARY 9, 10, AND 11, 1895.

WEDNESDAY, JANUARY 9, 1895.

At 4 o'clock P. M. the President called the Board to order, and the clerk called the roll. A quorum was present.

The President appointed Messrs. Glick, Churchill and Collins as a Committee on Credentials.

The Secretary read the minutes of the last meeting, which were approved and placed on file.

Upon motion, the program, as prepared by the Secretary, was approved.

The reading of the Secretary's report was deferred until the evening session, but, upon motion, was approved and ordered placed on file.

The Treasurer made his report, showing the old-time balance of \$1.97 was still on hand, which, upon motion, was approved.

Upon motion of Mr. Glick, all farmers who were present were invited to participate in the discussions that might come before the Board.

Upon motion of Mr. Smith, the Secretary was instructed to invite the members of the legislature to be present at the meetings of the Board.

Upon motion of Mr. Snyder, a vote of thanks was extended to the *Kansas Farmer* for the programs furnished for the occasion.

The Board adjourned until 7:30 P. M.

EVENING SESSION.

Board convened pursuant to adjournment; President Potter in the chair.

Prayer was offered by the Rev. F. S. McCabe.

The clerk called the roll, and a quorum was present.

Mr. Glick presented the report of the Committee on Credentials, which was adopted. The following-named gentlemen were reported as entitled to seats as delegates: C. L. Whitaker, Allen county; J. H. Coffman, Allen county; M. L. White, Anderson county; E. Harrington, Brown county; W. J. Workman, Clark county; C. E. Gifford, Clay county; George Throckmorton, Coffey county; George E. Cole, Crawford county; Martin Allen, Ellis county; J. C. Allen, Finney county; L. M. Pickering, Finney county; John H. Churchill, Ford county; W. H. Moherman, Franklin county; D. Needham, Franklin county; C. A. Maxwell, Grant county; Thos. H. Orr, Greeley county; D. W. Stanley, Jackson county; Edwin Snyder, Jefferson county; C. M. Dickson, Johnson county; V. R. Ellis, Johnson county; Ed. R. Smith, Linn county; W. M. Fleharty, Linn county; G. W. Erwin, Logan county; Geo. H. Cooper, Marion county; R. E. Trosper, Marshall county; Joseph Gamble, McPherson county; D. M. Ferguson, Miami county; D. W. Kingsley, Montgomery county; W. H. White, Morris county; E. L. Miller, Nemaha county; David Wilson, Neosho county; Thomas Cain, Osage county; Judson Linden, Osborne county; John E. Gebhart, Phillips county; G. A. Bishop, Rice county; D. E. Mickey, Rooks county;

A. P. Collins, Saline county; E. R. Powell, Sedgwick county; C. R. Cantrall, Wilson county.

Gov. L. D. Lewelling delivered an address of welcome, which was responded to by President Potter on behalf of the Board.

Secretary Coburn read his report, as follows:

Gentlemen of the Kansas State Board of Agriculture: A brief outline of the labor done in the office of this Board during the past 12 months, and a few suggestions as to its future, are submitted, as follows: The work first pressing for attention was the preparation, publication and distributing of 10,000 copies of the 110-page report for the quarter ending December 31, 1893, the statistical part of which, 48 pages, had been made ready under the administration of my worthy and able predecessor, and the report was issued as his.

Following this was the preparation of a report for the quarter ending March 31. The edition of this was 10,000 copies, giving the state's agricultural condition as existing at that time, together with 20 articles, practical and helpful, several of them specially prepared for our use, and also the 29 papers and their discussions that followed, at the preceding annual meeting in January. This was a book of 235 pages, costing a fraction less than 15 cents a copy for printing, and 6 cents per single copy for postage; the edition was 12,000.

The April crop report had four pages, and 1,500 copies were published and sent out.

A report for the month ending June 30, consisted of 58 pages of information as to crop conditions and helpful, practical agricultural literature. Ten thousand of these cost $5\frac{1}{2}$ cents each to print, and 2 cents each for postage.

In August, 7,000 copies of an illustrated 16-page bulletin, telling all that was known about the Russian thistle, its dangers, with which we are threatened, and how best to combat it, were issued, at a cost of 5 cents each, including postage. Twelve hundred posters, 20x26, illustrating and describing the thistle, were distributed to the north and west, where danger of invasion seemed most imminent.

In September, there was compiled, printed and distributed 2,500 August crop bulletins, containing also a table of population, by counties, for 1893 and 1894, with their increase and decrease.

The report for the quarter ending September 30 contained statistics of acreage and yield of leading crops; also, numbers of live stock, by counties, but was mainly devoted to the subject of feeding wheat to farm animals—the first investigation ever made along this line. It was an illustrated book of 216 pages, costing a fraction over 14 cents each for printing, in an edition of 12,000, and the postage was 5 cents each. This has been in great demand, from Atchison to the antipodes, by farmers, stockmen, millers, grain dealers, boards of trade, colleges, experiment stations, and scientists. The supply was quickly exhausted.

About November, was issued a 232-page book, devoted exclusively to alfalfa, its culture, uses, and worth. Ten thousand of these cost a fraction less than 15 cents each, and the postage, 6 cents per copy. The interest in this has been simply wonderful, and the demand at once became so clamorous that the edition was exhausted within one week of its completion by the printer, and almost hundreds of requests for it have come daily from all parts of the union. In this plant, the people of the western two-thirds of Kansas feel sure they have a great promoter of prosperity; that for many it points "the way out," and an edition of 50,000 of these books could be circulated with great profit to Kansas.

Simultaneously with the foregoing work, that of preparing the biennial report for 1893-'94 has been constantly in hand, and the material is now ready for the printer, designed to approximate 600 pages. The principal variations in this vol-

ume from the general character of its predecessors have been in the direction of making it more nearly a practical agricultural work for our own people, rather than so especially an immigration document for foreign consumption. In October there was laid before the honorable committee controlling the printing fund the facts and purposes with reference to this volume, with a view to making requisition for such number of copies as they would authorize. They were shown that in an edition of 3,500 (the number printed two years ago), such a book cost \$1.60 per copy; in an edition of 10,000, \$1.10 per copy; and in an edition of 20,000, the same book could be printed and bound for 80 cents per copy. The committee, who have, by the way, in every instance shown the kindest interest in the work of our Board, gave me written instructions to make requisition for 10,000 copies, and stated that \$11,000 of the limited printing fund should be reserved to cover its cost. The requisition was made within a few days, and at once returned with the information that a miscalculation had been made in their estimates, and an item which they had wholly overlooked, viz., paying the newspapers for printing the proposed female-suffrage amendment to the state constitution, would nearly if not quite consume the \$11,000 apportioned to the State Board of Agriculture. Hence this volume or any other information cannot be printed and distributed until our lawmakers appropriate funds for those purposes, and the same is true of any piece of the Board's printing, however significant or inexpensive.

Incidental to the preparation and distribution of the works described, there have been from 40 to 50 circulars and blanks, in varying numbers, formulated, printed, and mailed, some of them not only throughout Kansas, but to many other states. In size, these were from the 240-page schedules for assessors and abstracts for county clerks, to the thousands of postal cards mailed to all parts of the world saying we are unable to supply the various reports asked for. Something more than 3,000 individual letters and postal cards have been written, and all the more important copied; a larger number have been received and had attention.

The mere manual labor alone of addressing, stamping and wrapping the great number of books and pieces of mail matter mentioned is far from insignificant; it has been accomplished only by working night and day, regardless of hours, recreation, health, or eyesight, and any such volume of work need not be expected in future from the man, boy and Secretary now provided, as there is a limit to endurance even in agricultural laborers, as well as in pile drivers or locomotives. This is not related in a censorious or complaining spirit, but merely the frank statement of facts and conditions by a steward to his employers. Fourteen years ago, when I first came to the department, there were five able-bodied men in the office beside the Secretary; it is not unfair to assume that in those 14 eventful years the state and its agricultural requirements have grown somewhat, but the provision for office help was then about 40 per cent. greater than now, when so many problems press, and the needs of our people for help and counsel are so urgent. In those days the Secretary could accomplish much more with the clerk-hire fund, because he was permitted to divide it somewhat as the work necessitated, but in appropriation bills of later years the fund has been arbitrarily apportioned to two persons, and the work is limited to just what those two and the Secretary can accomplish.

There is a popular idea that the Secretary of this Board should be at all times available to go to any one of our 105 counties at any time they choose to hold a farmers' institute, a stock-breeders' meeting, irrigation convention, county fair, or Grange picnic, and deliver one or more instructive addresses, besides taking part in the discussions, and yet be in the office here ready to confer with and give helpful counsel on a great variety of topics, by mail and verbally, to the unnumbered throng who come, rightly regarding the office as a bureau of information. All this

could not be done by five secretaries. During the past year your present Secretary has attended the interstate irrigation convention, at Omaha; the national irrigation congress, at Denver, and the state irrigation convention, at Hutchinson, also meetings at Russell, Garden City, Dodge City, Tribune, Ottawa, Burlington, Great Bend, and Manhattan, and at several of them made addresses.

There are many who do not understand why the Board does not or cannot mail its publications to everybody, especially in Kansas, who might desire to be benefited by them. An explanation of this is suggested in that fact that an edition of 10,000 copies of any report — about the maximum number the printing and postage funds will admit of — affords, if none were sent outside the state, but one copy to each 30 voters, or say to each 125 or 150 of our population. An edition of 3,500 copies, as was published of the last biennial, would, if all of them were kept carefully corralled within our state boundaries, give one copy to about each 86 voters, or say each 400 of population. Hence the urgent requests from many worthy persons to "put me on your regular list for everything you publish" can scarcely be complied with on an extended scale, although the lists are in course of constant revision and change to accommodate as many as possible of newer applicants.

The extra or special work now confronting the Board, aside from the proof reading on, and wrapping, addressing, stamping and mailing a goodly edition of the biennial, which we shall still hope for, is that of taking the decennial state census, the extensive preliminaries of which should begin at once. The previous census, taken by Secretary Sims, in 1885, cost \$3,300 for extra clerk hire, and required a force of 15 to 25 special clerks for several months. Mr. Sims is of the opinion that under the present law a satisfactory census is an impossibility.

A good-sized edition of a good-sized March quarterly should be forthwith begun, to include the addresses and discussions at this meeting, and not perhaps an encyclopedia on the subject, but the cream of the best information we can gather in reference to irrigation and the water supply, that will be at once available and useful to the many thousands of people who need and are entitled to it. These and other thousands, not only in Kansas, but all over the union, are likewise going to be grievously disappointed if this Board does not early furnish another large edition of the report on "Alfalfa-Growing", and also on "Feeding Wheat to Farm-Animals." If, as the newspapers and people here and elsewhere charge, the Kansas Board stands at the head in its line of work, and desires to continue there, it must expect to pay the penalty attaching to such a reputation by furnishing to all comers the sort of information they seem naturally to expect from this Board, and somehow are never quite able to obtain anywhere else. The granting or withholding of suitable provision for doing these various lines of work rests of course with the legislature.

The idea that this Board should, as in its earlier years, conduct an annual state fair, while by no means prevalent, still lingers in the minds of a few. Doing this was found a source of weariness and vexation of spirit, and the Board has at least twice officially and forcibly expressed itself in opposition. Twenty years ago it declared: "The holding of fairs does not commend itself to our judgment as work best calculated to attain the ends sought in the organization and maintenance of a State Board of Agriculture. It brings it into a supposed rivalry with organizations which should act warmly as auxiliaries. It alienates, for the time being, sections of the state remote from the fair, disappointed in ambitions for its holding in their locality. It renders the Board liable to criticism and unfriendly feeling, in the unsatisfactory adjustment of competing claims and disputed questions always incident to such expositions. It absorbs the time and attention of the Board at a time when the whole state should have such attention at the local fairs."

At a later period, when it had risen to a still higher point of view, it did not hesitate to say: "The emancipation of this Board from the 'show business' has proved a satisfactory relief, and allowed the performance of much valuable work not attainable before. State fairs under the auspices of the state, and at the expense of the public treasury, are more than a humbug—they are a gross wrong. The practical results of such 'shows,' as generally conducted, are of as little value to agriculture as a circus. They afford amusement to the thoughtless, vexation to managers, disgust to the thoughtful, with profit only to the hotel keeper, peanut peddler, and those who bet on the right horse. We do not wonder that tradesmen in small towns should desire the state to make an annual show for their benefit, but we do wonder how, in the light of the past, it would be possible for the state to second this business desire."

Papers were read by ex-Gov. G. W. Glick and Samuel T. Howe.

Mr. Pickering offered the following resolution :

WHEREAS, Judge L. D. Bailey introduced into the state of Kansas a forage plant proving to be of great value, known by the name of and very improperly called Jerusalem corn : as a fitting tribute to the memory of the said Judge Bailey, we hereby change the name of the said corn from Jerusalem corn to Bailey corn ; and further, that our worthy Secretary be instructed, and all newspaper men be requested, when writing of the said corn, to call it Bailey corn.

Upon vote of the Board, the resolution was lost.

Adjourned until 9:30 A. M.

THURSDAY, JANUARY 10, 1895.

The Board met pursuant to adjournment, President Potter in the chair, and the meeting was opened with prayer by Rev. F. S. McCabe.

Papers were presented by J. B. Thoburn, Prof. S. C. Mason, Mayor T. W. Harrison, J. E. Nissley, and Chancellor F. H. Snow.

President Potter appointed Messrs. Glick, Hubbard, and Wheeler a committee to confer with a like committee from the State Dairy Association with reference to needed legislation on behalf of the dairy interest.

Adjourned until 2:00 P. M.

AFTERNOON SESSION.

The Board met pursuant to the adjournment ; President Potter in the chair. Papers were presented by O. P. Updegraff, Prof. Henry E. Alvord, F. C. Burtis, and S. M. Shepard.

Adjourned until 7:30 P. M.

EVENING SESSION.

The Board convened at 7:30, pursuant to adjournment ; President Potter in the chair. Papers were presented by State Senator Edwin Taylor, Vice President J. E. Hoagland, State Senator S. O. Thacher, Miss Gertrude Coburn, and Mrs. Nellie S. Kedzie.

Adjourned until 9:30 A. M.

FRIDAY, JANUARY 11, 1895.

The Board met pursuant to adjournment ; President Potter in the chair. Papers were presented by J. H. Churchill, C. H. Longstreth, Geo. M. Munger, and A. B. Montgomery.

Secretary Coburn introduced Mr. Wampler, state fish commissioner. Upon mo-

tion of Mr. Hubbard, the papers on "Fish Culture," also, on "Fertilizers," offered by Mr. Wampler, were referred to the Secretary.

Adjourned until 1:30 P. M.

AFTERNOON SESSION.

The Board met pursuant to adjournment, and proceeded to the election of officers. Messrs. Harrington and Wheeler were appointed tellers to receive and count the vote.

Thomas M. Potter, of Marion county, was placed in nomination for reelection to the office of President of the Board, and, upon motion duly seconded, the rules were suspended, and the Secretary instructed to cast the unanimous vote of the Board for Mr. Potter. It was accordingly done, and Mr. Potter duly declared elected.

Mr. J. E. Hoagland, of Jackson county, was placed in nomination for reelection to the office of Vice President.

Mr. A. P. Collins, of Saline county, was also placed in nomination for the office of Vice President.

The Board proceeded to ballot. Mr. J. E. Hoagland having received a majority of the votes cast, was duly declared elected Vice President of the Board.

Mr. Samuel T. Howe, of Shawnee county, was placed in nomination for reelection to the office of Treasurer, and, upon motion duly seconded and carried, the rules were suspended, and the Secretary instructed to cast the unanimous vote of the Board for Mr. Howe. It was accordingly done, and Mr. Howe duly declared elected.

The Board next proceeded to the election of members.

Upon motion of Mr. Snyder, it was ordered that the members be voted for all together, and the five receiving the highest number of votes cast (if a majority of all) be declared elected.

Messrs. T. A. Hubbard, W. J. Bailey, W. B. Sutton, Judson Linden, M. B. Tomblin, G. W. Glick, V. R. Ellis, R. T. Stokes, B. F. Campbell and G. A. Bishop were placed in nomination.

The Board proceeded to ballot, with the following result: Mr. Hubbard received 31 votes; Mr. Bailey received 32 votes; Mr. Sutton received 31 votes; Mr. Linden received 15 votes; Mr. Tomblin received 16 votes; Mr. G. W. Glick received 25 votes; Mr. Ellis received 12 votes; Mr. Stokes received 23 votes; Mr. Campbell received 21 votes; and Mr. Bishop received 14 votes — 46 votes cast in all.

Messrs. T. A. Hubbard, W. J. Bailey, W. B. Sutton, and G. W. Glick, having received a majority of the votes cast, were declared duly elected. One member yet to be elected.

Upon motion of Mr. B. F. Campbell, Mr. R. T. Stokes, having received the next highest vote cast, was duly declared elected.

Papers were read by J. H. Churchill, H. R. Hilton, and Prof. E. Haworth.

Mr. Ed. R. Smith offered the following resolution, which was unanimously adopted:

Resolved, That the members of the State Board of Agriculture tender to the President, Thomas M. Potter, and F. D. Coburn, our most efficient Secretary, our hearty thanks and commendation for the able, faithful and intelligent discharge of the duties of their respective positions.

Resolved, That, appreciating the full merit of the several papers read at the several sessions of this Board, we hereby return our sincere thanks to all of the distinguished persons who have so agreeably contributed to our instruction and pleasure, and particularly do we thank the ladies, Miss Coburn and Mrs. Kedzie.

Adjourned to 7:30 P. M.

EVENING SESSION.

The Board met pursuant to adjournment; President Potter in the chair.

Papers were read by Prof. G. H. Failyer, State Senator James Shearer, Chancellor F. H. Snow, and Gen. Roy Stone.

Adjourned *sine die*.

MEETING OF THE NEW BOARD.

OFFICE OF THE STATE BOARD OF AGRICULTURE,
January 12, 1895.

Meeting called to order by President Potter.

Roll called. Quorum present.

Oath of office administered to the newly elected officers and members, except Mr. Bailey, who was absent.

The appointive officers of the Board for 1894, with the exception of S. Z. Sharp, in place of Chas. S. Prosser, as geologist, and W. C. Stevens, as botanist, in place of L. E. Sayre, were continued.

On motion, the state veterinarian was made *ex officio* honorary veterinarian to the State Board of Agriculture.

Pres. T. M. Potter, Sec. F. D. Coburn, Treas. Sam'l T. Howe and Geo. W. Glick were appointed a Committee on Publications and Program.

As Committee on Needed Legislation, the following were selected: Wm. B. Sutton, chairman; Geo. W. Glick, R. T. Stokes, A. C. Shinn, T. M. Potter, F. D. Coburn, I. L. Diesem, and T. A. Hubbard.

Chairman Geo. W. Glick, of the committee of conference appointed to meet with a like committee from the State Dairy Association, reported that the committee had been unable to arrive at any definite conclusion or agreed line of action.

On motion of T. M. Potter, the Secretary was authorized to furnish each member of the Board with official letter heads.

On motion, any needed legislation was to be looked after and promoted by the committee which had been selected for that purpose.

Adjourned.

SOME DISCUSSIONS OF IRRIGATION PROBLEMS AND POSSIBILITIES, MOISTURE, SOILS, AND RELATED TOPICS, AS THEY PERTAIN TO KANSAS.

OUR IRRIGATION PROBLEMS.

By PROF. G. H. FAILYER, State Agricultural College, Manhattan; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

Since water is the first essential to irrigation, the questions pertaining to a supply of water are of prime importance. They must be answered first before the results of the solution of most other problems can be made available. While I fully recognize these problems as of first importance, I will mention them in this general way only, as others will handle them more ably than I could hope to do.

But if a supply of water is first, economy in its use is certainly second in importance. Any increase whatever in crops, from better methods of utilizing the water, is equivalent to a still greater increase in available water; for the greater crop is had at no more cost or labor in applying the water. A course of treatment that would so conserve the water as to double the product from a given amount would be equivalent in result to the discovery of another supply of water equal to that already known, and would be using it without any added cost in applying it. It seems to me that the economy of water has not received the attention that its importance deserves. All over our great plains region the one essential to crops that is limited in quantity is water, and no argument is needed to show that every available means should be used to prevent the waste of what there is.

The only loss of water from the soil that is not wholly accidental and useless to the crop is that which, passing up through roots and stems, is evaporated through the leaves of the plants. All other ways or channels by which water escapes into the air or runs away through the soil is pure loss so far as the crop is concerned. Among these ways that water is lost may be mentioned the loss from reservoirs when water is stored or collected in these. It is lost in two ways: by evaporation from the surface of the water and by seepage through the sides and bottom of the reservoir. The loss by evaporation must vary with the temperature of the reservoir and the velocity of the wind, perhaps also with its temperature. It is worth while that careful observations be made to determine the rate of evaporation under these varying conditions. These will necessitate a series of measurements of the amount evaporated, the velocity of the wind and the temperature of the water and of the air being noted at the same time. By this means a formula may be worked out, directly applicable to our plains region, that will tell what loss we may expect from evaporation.

The loss by seepage cannot, of course, be determined by direct measurement. But it is of some value to know how much is thus lost, and to experiment with various chemicals or other treatment to see if the bottom and sides of our reservoirs cannot be made more impervious. It is known that certain chemicals, as lime, open up the soil so as to let water pass through it much more readily. Other chemicals

seem to have a reverse effect. It is worth while that trials of the latter be made, to see if we cannot simulate in our reservoirs the condition that exists in buffalo wallows and alkali spots, enabling them to hold water like a dish. The latter condition may be more directly due to chemicals than has been supposed. Incidentally it may be said that to determine the seepage it may be necessary to measure water into the reservoir. In doing this, if the water be pumped by windmill, the actual work done by a mill may be determined. We will have the quantity of water raised a definite height, the size of the mill, and the velocity of the wind, as before mentioned, and it would not be difficult to record the number of pump strokes. I think that our engineers might in this way get some data that would be of use to them. It must be admitted that knowledge on the real work of mills is not in that satisfactory condition that would be desired.

But after the water has been secured and stored and saved and put upon the land, other losses at once begin. It tends to run off through the soil; growing plants absorb it and give it off through their leaves into the air; the heat of the sun and the warm, dry air take the water from the surface of the soil. More water rises to the surface from below, is carried away in turn, and so the waste of the water goes on. Does this vary with the condition of the soil and the tillage given it? It certainly does. What are the conditions that will reduce this loss to a minimum? Is subsoiling, by opening up a deep, loose, water-holding bed of earth—a subterranean reservoir—the proper way to prepare our soils, or will deep plowing, or even ordinary plowing, do as well? Will the water saved pay for the labor of preparing the soil? Should the soil be very finely pulverized? Should the pulverization be throughout the full depth of the stirred soil, or only at the surface? Will the retentive power of the soil be greatly increased by mixing well-rotted vegetable matter with it, and are we to learn that, as some now believe, admixture of chemicals, even in comparatively small amounts, will wholly change the deportment of the soil toward water, and that certain chemical treatment will make the soil highly retentive? Some believe that frequent and thorough surface tillage will *greatly* conserve the water. It is known that it does save the water in soils watered by rains. May it not be still more efficient when systematically employed on irrigated lands?

Our soils differ in their fine texture from some of the soils, if not most of them, that are irrigated in Colorado. There is little tendency for water to drain off through them, as is the case in sandy and gravelly soils. Indeed, perfectly dry soil wets up with extreme difficulty. Now, it seems possible that this fact may be made available to hold the water in the soil, so that the loss through the growing crop will be the greatest drain. If the dry soil below checks the water in its downward course, and a dry and pulverized soil will prevent loss upward, our sweeping winds, that may carry away this dust blanket, will be all that will prevent our storing water in our soils with great economy. The profit and extent to which water may be thus stored in autumn and winter months, when it is not needed for growing crops, is a question upon which we have urgent need for information. All of these things deserve careful and painstaking experimentation. Upon their solution may depend the success of irrigation upon any extended scale in our state.

But there are other matters of equal promise as problems to be solved by experiment: the quantity of water required for best results; the time and frequency of its application to the soil. It is well known that the quality as well as the yield of crops is influenced by the quantity of water in the soil. Almost nothing is known upon the water-holding properties of our Kansas soils. It seems probable that best results for water used, both in quality and quantity of produce, may be had not by putting on all the water that the soil will hold, but by making more frequent appli-

cations of a quantity of water that shall be a function of the water-holding power, but always less than the maximum amount. Each soil has its own individual power. And when the effects of different degrees of moisture are better known, it seems that intelligent effort can control the crop under irrigation to an extent unthought of where rainfall is depended upon. In such cases, there is no control of the moisture of the soil except in so far as a great excess may be allowed to run off by subsoiling and draining. The best that can be done is to grow the crop upon soils whose physical characteristics render them least unsuited under the often unfavorable weather conditions. This, on the whole, is a very unsatisfactory method. There may be no well-suited soil, and if suited to one crop it is frequently not of proper character for another. But under irrigation nearly perfect control of the soil may be had. What we want to know is what condition is required for the several crops. This is a very important problem, and one whose solution will require time, patience, and no small degree of penetration and skill.

It is manifest that, to make irrigation the most profitable, or even profitable at all, crops of the most value must be grown. It will take no more water, and no more labor in applying it, to grow an acre of a very valuable crop than to grow a cheap one. This means that our farmers, under irrigation, must abandon the crops which for the most part they have been accustomed to grow in other sections, and adopt a system of intensive farming suited to our conditions. They must learn that it is more profitable to grow a few acres of very valuable crop than many acres of a low-priced one. Of course, the successful irrigators realize this now.

But experiments must be carried on to learn what crops do pay best as well as the best way of growing them. Experiments should not stop with trials of crops at present known. Intelligent efforts should be made to find new crops that are better suited to the region than those now grown. Some plants are adapted to moist climates, others to arid ones. The plants differ in the form and structure of their stems and leaves, so that some lose water much faster than others. Is it not possible that there may be developed varieties or strains of plants that are better able to withstand our drying climate? By proper selection, almost any character or feature may be developed in plants. It would be strange if the adaptability to resist the loss of water from their tissues should prove so different from most of their other characters that it cannot be modified in the direction desired. I look upon the work of bringing out these new strains of plants as one of the promising problems before us.

I have thus briefly outlined irrigation problems which I believe are second in importance to questions of water supply only because irrigation is impossible without water. Of course much is already known upon the subjects mentioned. We have learned by laboratory methods and by observations and experiments in humid regions. But little has been done in these lines under irrigation. It is quite probable that, where conditions are fully under control, entirely different conclusions from those now drawn will be reached in many cases, and that many others of our present views will be modified. But even if our present conclusions are shown by rigid experiments to rest upon a sound basis, it is of great value to us to know with some degree of exactness the relative returns of a course of treatment. The returns from irrigation must be measured in dollars and cents. Of course the very methods necessary in experiments preclude the possibility of doing the work in an economical way. The dollars and cents must show on the wrong side. But the relative cost and results may be made so exact that the relative returns from field culture by these methods may be known.

A start has already been made toward the solution of many of the problems mentioned. It is fully recognized that hasty conclusions may work injury, and yet that

the problems are crowding for solution. Whatever is undertaken in the way of direct experimentation may be largely supplemented by farmers. Farmers should employ the most improved and approved methods, and their experiences should be brought together in such a way as to throw light upon the question of how to make a limited supply of water go the furthest.

AN INQUIRY INTO THE EXTENT TO WHICH IRRIGATION IN KANSAS IS POSSIBLE.

By PROF. ERASMUS HAWORTH, State University, Lawrence; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

The water supply, in general, may be obtained from three sources, viz.: Surface waters in natural channels and pools, such as rivers and lakes; rain waters that may be caught and utilized; and underground waters. Kansas practically has none of the first class, excepting the river waters due to rains within her borders. The rainfall is exceedingly variable, ranging from more than 40 inches per annum in the southeast to less than 15 inches in portions of the extreme west. There is a gradual decrease westward; the line of 25 inches of rainfall lies near the middle of the state, so that the eastern half has an average of about 32 inches, and the western about 20 inches, annually. The western half of the state may be divided into two approximately equal parts, the eastern of which has an average rainfall of from 20 to 25 inches, and the western one of 15 to 20 inches, with a small portion in the extreme southwestern part with less than 15 inches. In the character of the fall, there is also a gradual gradation from the east to the west. The rain storms in the east are generally more mild, but further west they increase in severity and at the same time become more local in character. It is not unusual for storms in the extreme western part of the state to equal a rate of two inches per hour, while such severity of precipitation is almost unknown in the eastern part.

UNDERFLOW.

No one knows how great an underflow different parts of the state have. It is certain that in portions there is a great amount of underground water, while it is equally certain that in other portions there is practically none. Here a brief consideration of the soil and other geologic conditions should be given, in order to bring the matter properly before us.

In a general way it may be said, that about one-third of the eastern part of the state, or 27,000 square miles, is covered by the coal measures and the Permian formations. In places within the northeast part of the state the glacial deposits may slightly modify the conditions which will be mentioned, but not to any considerable extent. Otherwise the whole of the area is principally occupied by limestone and shales, with only a thin covering of soil. The shales decay into a hard, compact subsoil, usually called gumbo, or hardpan. These conditions effectually and forever prevent the existence of any great and continuous body of underground water. It is only in rare places and over limited areas that the rain water has any opportunity to form a continuous body of underground water.

Occasionally there is a sandstone area a few miles in extent which would yield enough water to be of local importance in irrigation. A few river valleys also have unknown amounts of underground water. Of these, the Kansas river valley is the most noted. Wells sunk to about the level of the water in the river seem to furnish an inexhaustible supply. Colonel Dockery, of Lawrence, made a hurried examination of portions of the river two years ago, and concluded that for ordinary seasons

about one-third of the water in the river at Lawrence entered by seepage below Manhattan, all of which must come from the underflow along the valley. No tests on a large scale have been made to determine the amount of this underflow, but we may believe that this source alone will supply all the demands which are likely to be made upon it for many years to come. The valleys of the Osage river, the Neosho river, and other streams, likewise will furnish considerable amounts of underground water.

But, with all the river valleys and the sandstone areas included, it will not be safe to reckon on more than 5 per cent. of the eastern third of the state yielding underground water in sufficient quantity to be of any considerable importance in irrigation. We must look to the storage of storm waters, to the interception of the run-off waters, almost entirely in this area for our supply.

Immediately west of the area just considered is a large area of sandy and sandstone-covered country, approximating one-ninth of the state, or about 9,000 square miles. Its limits are irregular, and have not been carefully determined. It trends northeast and southwest, and reaches about to the Arkansas river.

Throughout this area large portions of the rainfall sink quickly into the sand and sandy soils, and are secure from surface evaporation, and only run off by the slow, percolating process which is carried on after the water has bathed the roots of the vegetation covering the surface. As a result of these conditions, water can be found at almost any place in this belt by digging, as is well illustrated by the city wells at Beloit, Abilene, and many other places, and in sufficient quantity to irrigate a very considerable portion of the area.

West of the Dakota sandstone area is a limestone and chalk-bed belt covering fully one-sixth of the state, or about 13,500 square miles. Here the conditions are similar to those already given for the coal measures. The soil covering is thin, and the subsoil and surface rocks are almost impervious to water, so that little of the rainfall is kept by the ground, and consequently no underflow can be expected, excepting in the immediate valleys of the different streams. Outside of such areas irrigation in this belt can be accomplished only by the storage of the storm waters.

Beyond the chalk beds to the west, the tertiary deposits cover the remainder of the western part of the state. They consist principally of a loose mixture of soil, sand, and gravel; consequently they have great absorptive powers. As a result, a large portion of the rain is held by the soil, and is allowed gradually to settle, until it reaches the impervious chalk beds beneath, the upper surface of which has about the same general level for any particular locality. Therefore, the water is reached by digging to a depth which will vary with the surface configuration of the country, increasing from only a few feet along the eastern borders to as much as 200 feet on some of the high uplands in the western part of the state.

It is not my purpose here to discuss the question of the source of all this underflow—whether it is entirely dependent upon local rainfall, past and present, or whether portions or all of it come from farther west. If water comes from the west, it occupies the same position with that gathered from the local rainfall, so that the irrigator can use the two indiscriminately. If the underflow is due entirely to local rainfall, it is probable that it has been accumulating for thousands of years, and therefore the present amount is considerably in excess of that which can be stored from year to year with our present rainfall.

The amount of this underflow seems to be very great, and its limit has not yet been reached by pumping, excepting along its eastern borders, where wells reaching it have been known to fail in dry weather. As it gradually works its way eastward it is brought to the surface in many hundreds of places in the form of springs and seeps, and furnishes the main supply of the dry-weather water for the numerous

streams in that part of the state which rarely are dry throughout all of their course any time in the year.

THE RUN-OFF.

The amount of run-off water furnished by any particular part of the state depends upon three factors: the amount of rainfall; the mode of precipitation—that is, whether it is usually in gentle showers or in hard and heavy storms; and the geologic conditions of the country. In the eastern third of the state, where the rainfall is from 30 to more than 40 inches, there is rarely a heavy body of loose earth or sand to absorb and hold the rain as it falls. Outside of the river valleys and the sandstone areas, it may safely be stated that the mantle of readily pervious earth is not more than 18 inches on the average. The inclination of the surface is generally quite great, for the whole country is cut full of channels and ravines, so that a lake or pond is rarely known, even in rainy weather. No measurements have yet been made to determine the run-off. From the similarity between the general conditions in eastern Kansas and in other parts of America where measurements have been made, it may safely be estimated that the run-off for all of our coal-measure Permian area is about 50 per cent. of the rainfall.

For the Dakota sandstone area the per cent. of the run-off is much less than for the coal-measure area. The general inclination of the surface is about the same, but the hills are less steep, the valleys less deep. The character of the soil and underlying rock, as already explained, is favorable to a great absorption of the rainfall. The increase in the severity of the storms of itself would tend to increase the run-off, but, considering the nature of the surface, it is doubtful if more than 35 per cent. of the rainfall passes down stream excepting by the slow-percolation process.

Over the chalk-bed area the soil is shallow, and the underlying rocks are hard and impervious and absorb but little moisture. The rain storms have increased in severity, so that it is not unusual for the rain to fall at a rate of more than an inch per hour, and in many instances of the so-called "cloud-burst" torrents pour down the streams, forming great walls of moving water. It is reasonable to suppose that during such storms fully 90 per cent. of the rainfall is carried away almost like water from the gutters of a house roof. But some of the rains are more gentle, so that the general average of the run-off is considerably less than the figures just given. This area certainly has the heaviest run-off of any portion of the state, and in the absence of observational data may be estimated at from 60 per cent. to 75 per cent. of the total rainfall.

Over the tertiary areas, the portions having the heavy underflow, the run-off is greatly reduced. The character of the soil mantle, to a depth of more than 200 feet in places, is most favorable for absorbing the rain as it falls, and probably 25 per cent. of the total rainfall will be a close approximation to the run-off.

From the foregoing, it will be seen that, in portions of the state, water for irrigation purposes can be drawn both from the run-off, or storm waters, and from the underground flow, while in other portions the storm waters alone are available, excepting along the river valleys. A short consideration of the methods by which such storm waters can be made available is now in order. In the eastern third, the coal-measure Permian area, it seems to the writer that the system of multiple reservoirs is the one most practical in a majority of cases. By this is meant a large number of small reservoirs, as distinguished from a small number of large ones. The conditions of the country are most favorable for such. The whole surface is cut into myriads of tracts by relatively small, narrow, but deep ravines. It is doubtful if a square mile of upland can be found within the whole area which does not have from one to a half dozen such ravines. Many of them are from 10 to 30 feet deep, and from 5 to 10 rods wide, while the larger ravines are often from 100 to 200 feet deep, and from 10 to 30 rods wide.

Over the area covered by the Dakota sandstone the ravines are not generally so deep and narrow, and suitable reservoir sites are not so numerous, but a sufficient number can readily be found. Farther west in the Fort Benton and the chalk-beds area the character of the ravines is very similar to those in the eastern part of the state, long, deep, and narrow, producing the best possible conditions for applying the multiple-reservoir method. All over this area it is easy to find ravines across which dams of from five to eight rods long and from 10 to 30 feet high can be built.

Farther west in the tertiary area the ravines again become less marked, their banks less abrupt, and their channels less deep. But with all this, countless numbers of good reservoir sites can be found.

RESERVOIR BUILDING.

The character of the soil and subsoil is a most important factor in reservoir building. It is an interesting and encouraging fact that in the eastern part of the state, and again in the chalk-bed region to the west, the subsoil and the rocks beneath are of such a nature that little attention need be given to leakage from the bottom and sides of the reservoir. The hardpan subsoils and the clay shales below in most places guarantee the preservation of all the water caught within the reservoir. The few isolated areas of sandy soils within these general areas are exceptions, and reservoirs built within them should be modified as will be shown presently.

Over the area of the Dakota sandstone, and of the tertiary farther west, the soil is so sandy and loose and porous that extra precautions must be taken or the reservoir will not hold water. Our pioneers in irrigation have already pointed out the remedy in such cases. They have put into practical operation the process called "puddling," and have proved that in most cases it of itself is abundantly sufficient. In some places, however, where the soil is unusually sandy, it might be well to add a little clay to the soil. Few farms can be found which do not have suitable clay near by, even in the most sandy districts, and the cost of procuring it is but little.

COST AND CONSTRUCTION OF DAM.

The cost of building dams and embankments is an important item in the multiple-reservoir system for irrigation. Not a cent of money need be spent if men and teams and plows and scrapers can be furnished. For all ordinary purposes, no material is needed excepting the native earth in the ravine. If well built, any dam not more than 25 feet high will be perfectly secure made from earth alone, and no particular engineering skill is required in shaping it. For higher dams it might be well to make a solid core of cement concrete, or in some other way add strength; but even then a sufficient addition to the width of the dam would make it secure.

In building the dam, one should first plow the ground on which it is to rest, and throw the first earth immediately upon the freshly plowed surface. In this way, the two masses will mingle and adhere firmly together, and thus avoid leakage at the line of contact between the dam and the ground beneath. Similarly, the banks of the ravine at the ends of the dam should be plowed or spaded, so as to form a covering of loose earth to assist in uniting the banks and the ends of the dam. The worst possible condition is to build an earthen dam immediately upon a solid rock. A line of seepage will unavoidably result between the two, and sooner or later destroy the surface of the dam. A good and spacious overflow should always be provided at each end of the dam, to carry off the overflow in times of severe storms. Great care should be exercised in their construction; otherwise they will give trouble by gradually cutting down the dam.

In order to obtain some clear ideas regarding the cost of dams when built by contract, I applied to Mr. R. W. Sparr, of Lawrence, Kas., a gentleman of wide ex-

perience as a railroad contractor, and one who has also built many ponds and reservoirs for various purposes in the Mississippi valley and the plains west. He furnished me the following general estimates for such work. A man and team should make from \$3 to \$4 per day at these rates. Earth can be moved—

25 to 60 feet for.....	7½	cents per square yard.
60 to 100 " 	8½	" "
100 to 150 " 	9½	" "
150 to 200 " 	10½	" "
200 to 300 " 	12	" "
300 to 400 " 	14	" "
400 to 500 " 	16	" "

No dam should ever be built less than three yards wide at the top, and it should increase downwards about three yards in width for every yard in height.

From these data one can readily calculate the cost in money or labor necessary to build any sized dam one may wish

SELECTION OF RESERVOIR SITE.

In the selection of a reservoir site a number of conditions should be considered, such as the area drained, and hence the probable amount of available water, the proximity of the reservoir to the land to be irrigated, and the depth and breadth of the ravine. Of course, the greater the area drained by a ravine, the more water it will furnish, but excessively large quantities are hard to handle, and therefore somewhat objectionable. One should compute the amount of water one will obtain by combining the approximate run-off with the area drained. In the eastern part of state, where the run-off will average from 15 to 18 inches annually, a reservoir covering one acre, with a dam sufficiently high to give an average depth of 18 feet, will be filled once a year.

The reservoir should be located as high up stream as the circumstances will permit, so that it will be above the maximum amount of ground to be irrigated. This is one strong argument in favor of the multiple-reservoir plan. Reservoirs may usually be built near the sources of the ravines to catch the drainage from the highest land, and thereby save a great amount of cost and energy in pumping from the lower reservoir to the uplands. They should also be located along the deep and narrow ravines, rather than along the broad and shallow ones. A given amount of water will thus occupy the minimum of surface, a point of considerable importance, for land adjacent a good reservoir is valuable. But, greatest of all benefits, the deep reservoir exposes the minimum water surface to the atmosphere, and thereby is subjected to the minimum loss of water by evaporation. In consideration of the fact that the only possible source of water for irrigation over about 40,000 square miles of our state is the run-off from the storm waters, the importance of all information pertaining to reservoir making is apparent.

SURFACE EVAPORATION.

The less the rainfall in any country the greater will be the evaporation from the surface, provided no extraordinary agency modifies the normal condition. In the western portions of our state the surface evaporation is very great. At Dodge City it has been found to be 60 inches per annum, and farther west it will probably be greater. Under such conditions, a reservoir only 10 feet deep would lose half its water by this process alone if allowed to stand the entire year. But there are a number of ways by which the conditions may be modified so as to give better results. We may deepen the reservoirs, and thus decrease the relative amount of surface exposed. We may plant shade trees along the borders, and in a few years have a protection which will very materially decrease the evaporation. And again, perhaps it is not beyond human agencies to contrive some kind of inexpensive floats which will decrease the evaporation more than half. But the greatest advantage of all,

perhaps, will be in using the water soon after it is caught. Ordinarily the rains come principally in the spring and early summer. If the water is run out upon the fields and meadows within three months from the time it is caught, the waste by evaporation may be reduced nearly one-half, the crops grown and harvested, and the farmer may laugh at the drought during the remainder of the year.

CONCLUSION.

Let us now return to our original inquiry: To what extent is irrigation possible in Kansas? The eastern third of the state, or 27,000 square miles, has an average yearly rainfall in but few places of less than 30 inches. Everyone will admit that were the run-off over this area impounded in reservoirs and spread back on the land in a proper manner, at the proper time, it would be an abundance of water for any and all crops. The Dakota sandstone area, covering one-ninth of the state, or 9,000 square miles, has about 25 inches rainfall upon the average. Considering the great amount of underflow which it is known to have, and the relatively low surface evaporation, a conservative estimate would place the possibility of irrigating 60 per cent. of the surface to a sufficient extent for the production of good farm crops well within reason. Could we impound three-fourths of the run-off water, a much larger proportion could be irrigated. Sixty per cent. of the area will equal 5,400 square miles.

Over the one-sixth of the state, or 13,500 square miles, covered by the Fort Benton limestone and chalk beds, the rainfall will average about 23 inches annually. Let us see what can be done here. Suppose the run-off is 60 per cent, or nearly 14 inches. If we catch this amount from 15 acres and impound it over one acre it will make a pool 210 inches deep. By its early use and by the protection of shade trees and other devices the evaporation can be reduced to not more than 40 inches. This would leave 170 inches of water, which applied at the rate of 20 inches will irrigate 8.5 acres, or 56 per cent. of the area from which it was caught. But it will be difficult to build such reservoirs and to catch all of the run-off. To be well within the bounds of the possible, we will reduce the above figures one-third, which will give 5,400 square miles. If farming with an abundance of water is sufficiently remunerative to pay for building reservoirs and catching the storm waters, these figures are certainly none too high.

We come now to the great tertiary area of more than 20,000 square miles, the area which has a pronounced underflow. With our present limited knowledge of the amount of this underflow and our ignorance of its source, and, therefore, of its future supply, any estimate of the proportion of the surface that can be irrigated is of comparatively little value. By referring again to the rain charts, it will be seen that the mean annual rainfall is from more than 20 inches on the east to less than 15 on the west, with an average of about 17 inches. It is submitted as a reasonable proposition, that if the soil was not so porous as to greatly decrease the run-off, any country with a 17-inch rainfall, which usually comes in severe and heavy storms, can have 25 per cent. of its area well irrigated if the run-off is properly impounded. But the area under consideration is so exceedingly porous at the surface that the run-off is greatly reduced.

What becomes of the water that sinks into the ground? The hard and relatively impervious chalk beds which must underlie the tertiary will arrest it only a short distance below the surface, and as the years go by there must necessarily be an accumulation of water just above the impervious chalk beds. Such waters can be reclaimed to a great extent and used upon the surface, so that the rain waters so largely sinking into the ground will add to the amount available rather than take from it, for the loss by surface evaporation is greatly reduced thereby. If waters

have thus been accumulating for thousands of years, or if there is a great sheet of water traveling eastward from the Rocky mountains, so much the better, for the volume will thereby be greatly increased.

Another point is of great importance here. The character of the soil is such that water spread upon the surface in irrigation operations will soon sink out of the reach of surface evaporation, and will gradually pass to the level from which it was drawn and help to maintain the supply beneath. Portions of it may thus be used over and over an indefinite number of times, which will greatly increase its efficiency. I have not been able to apply figures to the problem in any way which will yield less than about 25 per cent. of the whole area, or 5,125 square miles, as capable of being irrigated, while those portions lying along the Arkansas river valley can be irrigated to a much greater extent.

In all of these discussions thus far, nothing has been said about a considerable area of triassic age, lying along the south line of the state near the middle, and which covers about 11,000 square miles. It is known that large portions of it have a heavy underflow, and the eastern portions have from 25 to 30 inches rainfall, which of itself is sufficient for good crops many seasons. Some of the best and richest farming communities in the state are located within its borders, especially up and down the river in the vicinity of Hutchinson. We have perhaps less positive knowledge of the conditions of the underflow over this area than anywhere else in the state. Considering the rainfall, and the known underflow in the Arkansas river valley, it may reasonably be assumed that one-third of the area, or 3,666 square miles, may be well irrigated, with the probabilities favoring an increase rather than a decrease of this estimate.

Summing up these estimates, we have an aggregate of 46,000 square miles, or 56 per cent. of our state, which may be irrigated. This does not take into consideration improved methods of tillage designed to retard surface evaporation from cultivated fields, nor the increase of rainfall which may follow the extensive impounding of surface waters, due to the large surface evaporation.

DISCUSSION.

MR. COWGILL: Is the evaporation greater or less in this Dakota sandstone region than in other parts of the state—that is, the surface evaporation?

PROFESSOR HAWORTH: In general, I would say it is greater. The more sand there is in the soil, the more rapidly the soil will heat up, and, that being the case, would naturally make the evaporation greater.

A DELEGATE: If the evaporation were about the same, and these influences were taken as balancing each other, would not the run-off from the Dakota land be the same as from other portions—that is, the ultimate run-off? Of course, it disappears from the surface and goes away by different means, but the ultimate run-off would be the same, would it not?

PROFESSOR HAWORTH: No, I think not. Here in this country we have a good deal of material in the soil which will hold moisture. The rain will settle into that and hold an additional large quantity of water.

A DELEGATE: Do you say that a sandy soil dries out faster than clay?

PROFESSOR HAWORTH: The sandy soil will heat up more at the surface, and there will be greater evaporation. The question whether it would dry out more, 6, 12 or 18 inches deep, is an entirely different subject. I am not an authority on that; it is right in line with Mr. Hilton's talk.

A DELEGATE: I have found that in sandy soil, in July and August, melons will grow and keep green, while they will dry up on soil not sandy.

MR. HILTON: The sand in these sandhills has a great power for the transportation of water. Sand will convey water quicker than any other soil, but it will not hold as much. A clay soil will hold more, but water will pass through more slowly. Sandy soils take in all the rains, and if there is a subterranean supply within 10 to 15 feet of the surface, it seems to have a power to pump the water up to the roots of the plants. If, however, there is no such supply, the higher temperature of summer will usually increase the temperature of the top sandy soil and gradually dry it out faster than a fine, clayey soil. Clay will hold more moisture, and hold it longer than any other form of soil, but it must be protected by surface cultivation.

IRRIGATION POSSIBILITIES UPON THE HIGHER LANDS OF WESTERN KANSAS.

By A. B. MONTGOMERY, Goodland; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

I am placing a plant upon the table-lands of Sherman county, at a depth of 140 feet, which is not yet completed. After 17 or 18 years' residence in western Kansas, I certainly can speak to some extent as to whether or not agriculture is a success without irrigation. I am confident that it is necessary for successful agriculture that we irrigate. Our rainfall there amounts to about 17 to 18 inches per year, average.

If that was distributed through the growing season, it would be more than enough for successful farming. In the "arid" regions of the West, 12 inches of water applied at the proper time is sufficient for raising good crops—in Sherman county we would seldom fail to raise a crop if we could have from four to eight inches of water during the growing season in addition to our rainfall. Sherman county is 30x36 miles in extent, comprising 691,000 acres of land, mostly level prairie, rich loam soil, no hardpan. Under the entire county lies an inexhaustible supply of water. Ten per cent. of the area, or about 70,000 acres, lie within 50 feet or less from this sheet water.

The first requisite for successful irrigation is the supply of water. We, in Sherman county, feel that we have tested that question to our satisfaction. On the town site of Goodland, 3,700 feet above sea level, and 12 miles from the nearest running stream, on 160 acres of land, pumps are running that furnish 500 gallons of water per minute, or 30,000 gallons per hour, which means over one inch of water for 25 acres every 24 hours, and we find no diminution in the supply after continuous pumping for several years. One six-inch tubular well at the city waterworks has a capacity of 7,000 gallons per hour; two other wells, four inches in diameter, within 10 feet of the six-inch well, furnish 3,000 gallons per hour. With the above showing, we feel satisfied regarding the supply. I am further convinced that the problem of irrigation by pumping, from the depth of 50 feet, is an assured success. I cite you to the wonderful progress made by the people of Garden City and vicinity; also, to parts of western Nebraska, besides many places in numbers of our western counties, all done by pumping, and using the windmill for power.

As a large part of Sherman county lies above 50 feet in depth to water, the problem to be solved is, can we successfully lift the water to enable us to irrigate and compete with the rain belt, or more favored sections of our country? We find people moving to the western deserts, onto land covered with sage brush and alkali, paying exorbitant water rights, putting up with many inconveniences, long distances from markets, and yet, after all, making a success. Why? Because of irrigation. Through that means they are able to raise more per acre, of better quality,

than the farmers within the rain belt. They till less land; they become better citizens socially by living in closer communities.

But why leave Kansas for the deserts? We have millions of acres of better soil; all the conveniences to civilization; water within easy reach, only waiting to be placed on the soil by the windmill and pump. Through that means the farmer is independent of exorbitant water taxes; he is within easy reach of markets, both east and west. Now, can we solve the problem of irrigation on the higher lands? It is an assured success up to 50 feet to-day. How short the time since croakers said it was impossible to irrigate by pump at any depth? May we not look forward with hopes of success to the near future, when the mind of man will give us a wind engine to lift the water at 100-foot depth as easy as it is to-day at 50-foot depth? We must utilize the wind power that blows across the prairies of western Kansas; we must harness that great power, through the agency of the windmill, connect it with the great supply of water beneath; then with the four great factors, wind, water, soil, and brains, the problem of successful irrigation in western Kansas will be solved.

I am confident the mind of man will give us the pump and windmill for deep pumping when the demand arises. The mind of man has never failed yet when a necessity required. The demand is here, and to-day the great factories are sending out men to study the demands for windmills for deep pumping. Some one in this meeting suggested the gasoline or steam engine. That power is too costly for the average farmer settled on the frontier of our state; you must give him cheaper power; you must give him a pump and windmill within reach of his means. Since the possibility of irrigation by pumping has opened a way out for my people, they have not been idle the past season. There are to-day, built and building, 150 reservoirs in Sherman county for irrigation purposes; one year ago there were none. A Mr. Hunter has a 10-foot windmill, 2½-inch cylinder, 1¼-inch pipe; the plant, when erected, was intended for pumping stock water and domestic purposes; the depth to water is 140 feet. The past season he watered 17 head of stock and irrigated a garden patch of one-fourth of an acre, realizing from the latter \$52. A Mr. Butts, another farmer having a similar plant, and only intended, when erected, to supply stock water, besides watering 32 head of stock, also irrigated one-half of an acre of garden, from which he realized \$92, the depth to water being 135 feet. I only give you these instances to show that what has been done on a small scale can be done on a large scale.

The county commissioners of Sherman county placed a windmill plant in the courtyard this last season; the well is a four-inch tubular, the depth 160 feet. Two acres were irrigated, and the windmill laid idle three-fourths of the time for want of reservoir room, the reservoir being too small for the capacity of the plant. This plant, we estimate, will irrigate eight acres. The windmill is 18 foot. It has filled the reservoir, which holds 70,000 gallons, in 2½ days. I could give instances of the success of several farmers in Sherman county the past season who have irrigated, by pumping, for the first time.

I am satisfied the success of irrigation must come through individual efforts. Any legislation that will help to that end will be thankfully received by our people. The creation of an irrigation board at high salaries will not benefit Sherman county; large appropriations expended in testing the supply of water will not benefit our people. We have demonstrated that fact already. What we need is funds to supply farmers with pumping plants, giving them time enough to raise, say two or three crops. If the farmer could buy a pumping plant at one, two and three years' time, he could "see daylight."

If any legislation is enacted or required to test the supply of water, I would recommend that the state appropriate \$20,000, and have the county commissioners of

the organized western 40 counties place a pumping plant, to cost not over \$500, either on school land or the county farm, at a depth not less than 75 feet, and to make their reports of the success of such plants direct to the Secretary of the State Board of Agriculture. We feel that the State Board of Agriculture is friendly to the people of western Kansas, and we feel that we have a friend in the worthy Secretary, who has by many efforts and kind acts cheered us on, knowing that a great future is developing for western Kansas.

Major Powell says 5 per cent. of western Kansas can be irrigated. He says that 5 per cent. under irrigation will give us the densest populated part of Kansas. I am confident, with my knowledge of the water supply and soil of Sherman county, that 20 per cent. can be irrigated. If so, then what a grand future awaits the toilers of western Kansas, and especially Sherman county.

At a depth of 150 feet, a pumping plant that will irrigate 10 acres of ground can be placed at a cost not exceeding \$400. The farmer can build his reservoir himself, with only the cost of his labor. The first crop will repay all outlay and leave a surplus. In a few years the windmill plant that to-day is a luxury will be a staple article, and the price will be much lower. One very important point is to have a pond or reservoir. The reservoir should be built as near the top of the ground as possible, so as to get a good head of water in order to successfully flow over the ground to be irrigated.

To build a reservoir, scrape off about six inches of the top soil, drag it to one side, and make the bottom as level as possible; pump water onto the floor until it is soaked down, say two feet, let it settle a little, then tramp with horses or cattle until it is as hard as a road bed. Begin your walls *on top of the tramped floor*, say about 10 feet wide at the bottom; make 5 feet high, and 3 feet wide at top; while building the wall let the pump run, so as to fill the pond as fast as you build the walls, taking the soil from the outside of the pond to build with.

DISCUSSION.

PROF. ROBERT HAY: I have lately been completing some studies of the water conditions in the region spoken of by Mr. Montgomery, and am able to speak confirmatory of the opinions expressed as to the quantity and steadiness of the water supply in Sherman county and neighboring parts of the plains. Some of the wells have 40 feet of water, and the grouping of four wells worked by steam pumps in the city of Goodland seemed to produce no diminution of the water supply. That part is one of the best for a steady supply of water on the plains, there being a larger area to the west very favorable to the absorption of a large percentage of the rainfall and passing it down to the subterranean reservoirs which hold it until the drill taps them. There are other parts of the state, notably one south of the Arkansas, where the volume of water is probably as great, but Sherman county has tackled the problem of pumping water for irrigation; numerous reservoirs are being constructed for that purpose, and fall and winter irrigation is already practiced.

DR. G. BOHRER: My farm is in Rice county, in the center of the state. I have 40 acres that are higher than the rest of my farm. There are three draws running through it, and a dam across each one since about eight years ago. They have never held water until this year, although this has been the driest season. The reason they have not held water is, that the ground there is porous. There is no clay subsoil. My cattle and horses have had access to these ponds, and have been tramping the bottom all these years. The year 1894, although the driest of the whole eight, they have held some water. In time, I think, they will hold quite a plenty, which, I believe, will be beneficial in the way of irrigation. The character

of the soil ought to be considered by everybody. They cannot expect their ponds to hold water until they are thoroughly puddled. When soil is coarse, with a clay subsoil, it being less porous, will not allow the water to seep or settle away.

L. M. PICKERING: To you men of western Kansas I desire to say, that I think from my experience and observation I can tell you a plan to grow 10 acres, more or less, of alfalfa without the expense of paying for ditch water, or pumping it from the underflow, but for which there are three requisites which almost every quarter section in western Kansas possesses. *First*, A gradual slope. *Second*, What western Kansas does have—rain—frequently several inches falling in a very short time. *Third*, That alfalfa does not require water to be applied at any certain time of the year. Select the lowest part of your land, about one acre to each 10 of slope that you have at your command. Put a level on it and lay off checks parallel with the contour of the slope running the length of the land desired to be sown to alfalfa. Throw out checks one foot high, more or less; then below 50 or 100 feet, another check, and thus check up all the land desired to be sown. Then from the opposite corners of the land run checks up the slope to gather the run-off and conduct it on to the alfalfa. If you can thus gather the run-off from 100 acres, and conduct it on 10 acres, from a dashing rain, that will give you one acre inch of run-off; you will then have 10 inches of water on your alfalfa, which will assure at least one good crop of hay.

DOCTOR BOHRER: I would like to ask why my pond will not hold water.

A. B. MONTGOMERY: If the doctor will follow the instructions I outlined, he will have a pond that will hold water like a jug. The wood or box outlet I find gives considerable trouble at times by leaking, and the gates are often swollen—they are hard to operate. Mr. Jordan, of Wallace county, has an outlet to his pond that I think superior to the wooden outlet. He placed a four-inch pipe at the bottom of the bank; inside of the bank there is an elbow with another joint of four-inch pipe, that, when turned up, reaches within six inches of the top of bank. The pipe is made loose enough at the elbow to turn easily; when he wishes to draw water from the pond he turns the pipe down; when done, he turns the pipe up. The pond cannot run over, for the water will run out of the pipe first down through the ditches, causing no harm. If the pond contains fish—and every well-regulated pond should contain fish—tie a wire screen over the end of the pipe.

DR. W. J. WORKMAN: The "Jumbo" wind engine has been in use, in a limited way, for the last 10 years. The first one was built somewhere north of Garden City, and was called the "Dutch windmill." Why it was so named I have never learned. The principal incentive to its construction and use was economy in cost. It was not thought at that time that great power could be obtained from them (much greater than from any other form of windmill known), and yet keep the diameter of the wheel so small as not to endanger it in high winds.

These invaluable properties have been determined quite recently. The growth in size and usefulness has been quite gradual, and not until within the last year or two have they been sufficiently perfected to give a definite idea of the scope of their usefulness. The first wheel of any considerable power that I am familiar with was erected by John H. Churchill, of Dodge City. This has a diameter of 14 feet, with a shaft 12 feet in length. It is built with eight radial fans. Mr. Churchill is able, with this wheel, to run two pumps, one of 6 and the other of 4 inches in diameter. Since the construction of this, one of large size has been built at the soldiers' home, near Dodge City, furnishing power for a 6- and an 8-inch Gause pump.

I have recently constructed the largest "Jumbo" yet attempted. The diameter of the wheel is 21 feet, with eight radial fans, mounted on a steel shaft 27 feet in length. The wheel is in two sections, with central bearings for the shaft. This

wheel is intended to run a pump 15 inches in diameter, 24-inch stroke, furnishing about 700 gallons of water per minute, 14-foot lift; also a water elevator with a capacity of 800 gallons per minute. I find that I have power going to waste in a 15-mile wind. The question of how great a diameter can be given a wheel built upon this plan and yet not be endangered by high winds has not been determined. However, should 20, 40 or 100 horse power be required, the shaft can be extended indefinitely, adding sections of radial fans of 10 or 12 feet in length, doubling the power whenever we multiply the number of fans by two. I am satisfied that a "Jumbo" can be built with 100 horse power at a cost not to exceed \$500. If the cost should be double the estimate, it would still be a marvel of cheapness.

One objection, urged by those who had not observed their work, was that only north or south winds would furnish power. This objection has no foundation; in fact, I have found that when the wheel is properly constructed it works equally well with the wind at any quarter, and only stops when the wind comes directly from due east or west, which is so seldom as not to be taken into account. Wheels of great power should always be mounted on a steel shaft, not less than $2\frac{1}{2}$ inches in diameter—the spokes secured in cast spiders, secured to the shaft by means of keys and set screws. Two or more pulleys with eight-inch face will be found necessary, to which to apply brakes, or to carry power to grinding or other farm machinery. These large wheels may be turned loose in the highest winds without injury—in fact, when all other windmills are thrown out of gear by high wind, the "Jumbo" is doing double work. The castings and shaft can be obtained at any foundry; the other materials at any lumber yard, and any farmer, with the assistance of the neighborhood carpenter, can build his own wheel. Where large quantities of water are to be raised from a depth of from 100 to 300 feet, as is the case on the table-lands of western Kansas, or where a large head of water (with low lift) is desired, no power that I know of will compare in point of economy with the latest improved "Jumbo."

PERIODICITY IN KANSAS RAINFALL AND POSSIBILITIES OF STORAGE OF EXCESS RAINFALL.

By CHANCELLOR F. H. SNOW, State University, Lawrence; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

It has been the prevailing opinion from time immemorial that there is no better example of variability without law than the weather, and no one of the meteorological conditions whose combination produces the general result called weather has seemed to be more intractable in its subjection to natural law than rainfall. Rainy seasons are followed by dry seasons, and dry seasons by rainy seasons, and the meteorologist who would maintain a regular periodicity of rainfall has hitherto generally been looked upon with suspicion and distrust by his fellow-men. Not only have the common people failed to recognize periodicity of rainfall, but many meteorologists have given up the apparently helpless attempt to reduce the seasons of flood and drought to any semblance of regular alternations of occurrence. The writer, however, having personally recorded the weather at the same station for the period of 27 years, has observed in the records at Lawrence an evident periodicity in the rainfall. In his weather report for July, 1887, the remark was made, "We are now passing through a period of rain deficiency, one of which, according to our observations, occurs about once in seven years." In an article presented at the annual meeting of this Board in January, 1888, the writer also stated that he had discovered a periodical oscillation in the rainfall of Kansas. "The length of the rain cycle seems to be about seven years; that is to say, in each period of seven years there ap-

pears to be two or more consecutive years whose rainfall is above the average, followed by a similar series of years whose rainfall is below the average."

At the time when these words were written the writer had completed three seven-year periods of his rainfall record. At the present time his observations have covered nearly four such periods, or a total of 27 years. In this period of 27 years there have been at Lawrence four short series of years with rainfall above the average, and four similar series of years with rainfall below the average. The years whose annual rainfall has been above the average were: 1868 and 1869; 1876, 1877, and 1878; 1883, 1884, and 1885; 1888, 1889, 1890, 1891, and 1892. The four series of years in which the annual rainfall has been below the average were: 1870, 1871, 1872, 1873, 1874, and 1875; 1879, 1880, 1881, and 1882; 1886 and 1887; 1893 and 1894. The rainfall records at Fort Leavenworth, extending over a period of 48 years, and being the longest rainfall series in the state, exhibit a similar seven-year cycle. The same cycle is unmistakably indicated in the 21 years' record at Dodge City. A similar cycle is less plainly traceable in the 37 years' record of the agricultural college, at Manhattan. Since discovering these indications of periodicity in his own records at Lawrence, the writer has observed that Eastern meteorologists have called attention to a similar periodicity; so that it may be considered as a well-established fact that the rainfall of the United States universally follows a more or less conspicuously indicated seven-year periodicity. It should be remembered, however, that this seven-year cycle does not mean a succession of seven wet years followed by a succession of seven dry years, but each seven years constitutes a complete cycle in itself, one portion of the seven having a rainfall below the average, and the remaining portion of the seven having a rainfall above the average.

An examination of the records also shows that the precipitation during the growing season, March 1 to September 1, follows substantially the same seven-year periodicity as the annual precipitation. It becomes, then, a question of importance whether the excess of rainfall in the months and years whose precipitation is above the average cannot be stored in such a way as to be of service in the following months or seasons when the precipitation is below the average. In a general way, undoubtedly a large portion of the excess of rainfall may be stored in the soil itself, after the surface has been broken by the plow. If the cultivated area of the semiarid region were to be increased upon an extensive scale, a large portion of the excess of rainfall would be retained upon the area upon which it falls. It is a problem whose solution will secure important results to the western farmer, whether a considerable portion of the excess of rainfall may not be stored upon the surface in artificial reservoirs. The evaporating power of the dry atmosphere of western Kansas must be more accurately determined before a definite solution of this problem can be attained. The configuration of the surface of the country in central and western Kansas is such as to admit of the construction of storage reservoirs with comparatively little expense, and there is a strong probability that success would attend the general construction of such reservoirs throughout the semiarid regions. Experiments like those of Mr. Geo. M. Munger, of Greenwood county, are prophetic of excellent results, and it is to be hoped that many such reservoirs will be constructed for experimental purposes during the coming year.

While it is unquestionably problematical whether excess of *annual* rainfall can be kept over in reservoirs and suffice to produce practical results in irrigation during a following year of drought, there certainly can be no doubt that excessive *monthly* rainfall may be so stored as to be of practical value in irrigation during one or more months of dry weather following a month of rainfall excess. Two or three diagrams are presented herewith, showing instances of excessive precipitation in one or two months of the growing season followed by one or two months of

deficient precipitation. Thus, at Dodge City, in the month of May, 1881, there was an extraordinarily abnormal rainfall of nearly 13 (12.82) inches; in the month of July, of the same year, the precipitation was over five inches, more than an inch and a half above the average, but in the intervening month of June there was less than two inches of rainfall. Here, certainly, is an instance in which the excess of nine inches monthly rainfall above the average in May could have been made available in storage reservoirs to tide over the following month, whose precipitation was less than half the average. Similar instances are to be found not infrequently at Lawrence, Manhattan, and all other Kansas stations. During the year 1881, a damaging deficiency occurred at Lawrence and Manhattan, in the middle of the growing season, following an excess of precipitation in the preceding months. Storage reservoirs in such cases would relieve many of the difficulties of the situation and enable the irrigator to produce a good crop, when otherwise a total failure would have been inevitable.

It is estimated that from 60 to 90 per cent. of the rainfall in western Kansas runs into the streams, and is of no benefit to the region in which it is precipitated. The preservation of even a small portion of this waste water would be of incalculable value for agricultural purposes. The rains in western Kansas are generally quite local, and consist of a heavy downpour in a comparatively short time. Long-continued, moderate or drizzling rains are almost unknown in that portion of the state. As an instance of the local character of these rains, I may mention a storm which occurred in a portion of Kiowa county, at Haviland, in June, 1894. It was estimated that five or six inches of water fell in three or four hours at Haviland. At that place the railroad embankments of the Rock Island and Santa Fé railroads ran parallel to each other, about 15 feet in height, separated by only 100 feet. The Santa Fé embankment has trestlework, admitting the passage of rain water almost without obstruction. The Rock Island embankment is continuously unbroken by trestlework, the only provision for the escape of rain water consisting of large drainage tile. At Haviland, at the time above noted, the extraordinary rainfall, passing through the trestlework of the Santa Fé embankment, was temporarily obstructed by the Rock Island embankment, so that the whole space between the two embankments was filled to the level of the tracks, 15 feet above the general level of the prairie, notwithstanding the fact that the large drainage tiles in the Rock Island embankment were removing so great an amount of water as to produce whirlpools above them wherever they were located along the course of this temporary reservoir.

The conditions are favorable for the construction of artificial reservoirs in that part of the state upon almost every quarter section of land, without extravagant expenditure of time, labor, or money.

It is the purpose of the present paper simply to call attention to the unused excesses of rainfall, and not to speculate upon the effects which would be produced upon the climate by the general construction of storage reservoirs. I will simply state, in conclusion, that these would undoubtedly have the tendency, if sufficiently numerous, to increase the humidity of the atmosphere, to gradually increase the amount of rainfall, and to reduce to an uninjurious minimum the hot winds of local origin which now so frequently destroy the growing crops by their burning touch.

EVAPORATION AND STORAGE OF SOIL MOISTURE.

By H. R. HILTON, Topeka; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

A boulder projecting from the mountain side we call granite, or limestone, or sandstone. The same rock disintegrated or ground fine we call soil. The fineness of this soil or smallness and shape of these rock particles largely determines its fertility and value.

The growing plant must have its food dissolved in water before taking it from the soil. It matters not how rich the soil may be, it is barren to the growing plant till a certain percentage of moisture is present to dissolve its fertile elements and make them available; hence, the mechanical arrangement of the soil grains becomes important, because this determines most the quantity of water a given bulk of soil will absorb and retain.

In the finest clay soils there are from 10,000,000,000 to 25,000,000,000 grains in a gramme (or $15\frac{1}{2}$ grains troy). These rest one against the other, just as cannon balls do when stacked up in pyramids. Each cannon ball has six points of contact, and the space between the cannon balls is almost equal to the space occupied by the ball of lead. It is the same way in the soil, but the finer the soil grains the lighter they will rest against each other, and, relatively, the greater the amount of space between.

In ordinary soils, when dry, this space is about 50 per cent. of the whole mass. That is to say, in a cubic foot, one-half is soil, and one-half is air space. If water is applied it will gradually fill this air space, and when the soil has taken up all the water it will hold, one-half of the cubic foot will be soil and one-half water.

By pulverizing the soil finer, or making the grains more round and uniform, the soil may be made to take up 60 per cent. of its bulk of water. This is, in a 10-inch depth of soil fully saturated there will be six inches of water and four inches of soil, or the same results may be secured by the application of manures and fertilizers, which cause a rearrangement of the soil grains, and increase the power of the soil to retain moisture.

While a cubic foot of ordinary soil when isolated from other soil will absorb 50 per cent. of its own bulk of water, no matter at what point the water is applied, top, bottom, or side, it does not follow that in its natural position in the soil it will remain so saturated. If it should, vegetation would soon suffer for want of air at the roots. It is only during heavy showers that such a condition exists in a good soil. When the shower ceases the surplus finds its way into the subsoil, and it is the percentage of moisture held back from drainage that determines the value of the soil.

In soils of equal fineness, the soil having the most-rounded forms has the greatest surface-tension power. Soil grains uniform in size have also greater surface tension than soils equal in number but irregular and varied in size.

For instance, in a test made recently, dry sand from the top of a sand hill south of Garden City pulled the water up to a height of $13\frac{1}{2}$ inches. The finest sand sifted out of the Kaw river at Topeka, under similar conditions, pulled the water only one inch above the water level. The sand-hill sand was undoubtedly finer, but its greatest advantage seemed to lie in its more uniform size and more rounded form. The Kaw river sand was angular and irregular, and what is known as "sharp" sand.

To appreciate the differences in the capacity of different soils to retain water, it is important to understand something of the manner in which water moves and acts in the soil.

Prof. Milton Whitney, of the United States department of agriculture (our best authority on this subject), gives the following lucid description and illustration:

"There is, on an average, about 50 per cent. by volume of space within the soil

which contains no solid matter, but only air and water. This we shall call empty space. In a cubic foot of soil there is about half a cubic foot of empty space, but this is so divided up by the very large number of soil grains that the spaces between the grains are extremely small.

"When a soil is only slightly moist, the water clings to the soil grains in a thin film. It is like a soap bubble with a grain of sand or clay inside, instead of being filled with air. Where the grains come together, the films are united into a continuous film of water throughout the soil, having one surface against the soil grains and the other exposed to the air in the soil. As the soil grains are surrounded by this elastic film, the tension on the exposed surface of the water will support a considerable weight; for the soil grains, thus enveloped, are extremely small, and have many points of contact around which the angle of the surface is more acute and the film is thicker and is held with greater force.

"If more water enters the soil, the film thickens, and there is less exposed water surface. If the empty space is completely filled with water, there will be none of this exposed water surface, and, therefore, no surface tension. Gravity alone will act, and with its greatest force. If the soil is nearly dry, there will be a great deal of this exposed water surface, a great amount of surface tension, and, with so little water present, gravity will have its least effect.

"The grains in a cubic foot of soil have, on an average, no less than 50,000 square feet of surface area. There is less, of course, in a sandy soil, and more than this in a clay soil. If there is only a very small amount of water in the soil the film of water around the grains will be very thin, and there will be nearly as much exposed water surface as the surface area of the grains themselves. If a cubic foot of soil, thus slightly moistened, and having this large extent of exposed water surface, be brought in contact with a body of similar soil fully saturated with water, in which there is none of this water surface, the water surface in the drier soil will contract, the film of water around the grains will thicken, and water will be drawn from the wet into the dry soil, whether it be to move it up or down, until, neglecting gravity or the weight of the water itself, there is the same amount of water in the one cubic foot of soil as in the other. When equilibrium is established, there will be the same extent of exposed water surface in these two bodies of soils.

"When water is removed from a soil by evaporation or by plants, the area of this exposed water surface is increased, and the tension tends to contract the surface and pull more water to the spot.

"When rain falls on rather a dry soil, the area of the exposed water surface in the soil is diminished, and the greater extent of water surface below contracts and acts, with gravity, to pull the water down.

"Fertilizers change this surface tension and modify the contracting power of the free surface of water to a remarkable degree, and so modify the power which moves water from place to place in the soil."

In fine or well-pulverized soils gravity is of minor influence in distributing the falling rain through the soil. Surface tension is the great power.

It is important to remember that a dry soil has no surface tension or capillary power, and that the rainfall acts in an entirely different way when it falls on a moist soil than it does when it falls on a dry soil.

We will take, for instance, the effect of one inch of rain falling within 30 minutes, on various soils. If the top foot of soil contains 10 per cent. of moisture, the first raindrops thicken the films around the surface grains. Those immediately underneath, having a thinner film and greater pulling power, draw from the grains just above. The next grains nearest pull from these, till we find the entire inch of rain distributed through the top six or seven inches of soil, increasing its percentage to

25, which is the limit of the power of the majority of soils to hold back from drainage. This may be decreased somewhat by the "pull" from the soil immediately below, if the mechanical arrangement of soil is favorable and moisture content less.

As a rule, the rainfall will be distributed equally through the mass of soil of equal firmness, so far as 20 per cent. content will go.

Now note the effect of the rainfall on some soil which has the same mechanical arrangement but no moisture in top foot of soil.

The air space in the dry soil is about 50 per cent. The falling rain immediately fills all the air spaces. There being no water films on the exposed surface of the soil grains to produce tension and pull the water down, it descends by gravity only. The fineness of the spaces retards the flow, and the air imprisoned below the moist soil offers resistance. Two inches of dry soil, when fully saturated, will hold one inch of rainfall, and in a finely pulverized soil rarely descends over three inches from surface. If two inches of dry soil will take up one inch of water from below, and hold it, three inches of dry soil will have equal power to hold one inch of rain, in spite of gravity, so long as there is no moist soil in contact with it to distribute it.

In a very fine soil, that nearest surface tends to puddle during a rain, forming a muddy blanket on surface several inches thick, which prevents the further rains from passing through, and forces it to drain from the surface, causing washing.

In sandy soils, the spaces between the grains are larger, and the friction and resistance less than in finer soils, and water passes through them by gravity, even when dry, but not so readily as when slightly moist. Gravelly soils offer slight resistance to descent of water, and hold back a low percentage for use of plant life.

In gumbo or hardpan soils, the arrangement of the soil grains is so close that water penetrates with difficulty. They retain a high percentage of water, but absorb it slowly, and give it out slowly, sometimes too slowly to supply the demands of the plant.

As already stated, the finest soils retain the most water, because of the smaller spaces between and, in the aggregate, larger surface space in a given bulk of soil. The soil that has most water surface has most root surface. The finest soil grains are easiest dissolved, and hence are most available for plant food.

We often hear of soils wearing out. This often means that the finest soil grains have been dissolved in the process of feeding the plants, leaving the soil mass with a coarser mechanical arrangement, which reduces its power to retain moisture. With lessened water supply, the ability to prepare food is impaired, and, in the midst of plenty, the plant starves. The soil has still the elements of fertility for many varieties of plants, but not available. It only wears out completely when all the soil grains are dissolved. The fertility of soils may be largely restored mechanically by thorough cultivation, and pulverization, to make it fine and increase its capacity to retain water, or chemically, by adding stable manure or commercial fertilizers. The effect of the latter seems to be fully as much in causing a mechanical rearrangement of the soil grains, and increasing the water content, as in furnishing new food elements.

I have tested soils of the Kaw valley, near Topeka, and of the uplands near Hoyt, Jackson county, and found that manured soil, from same field, would take up and retain 10 per cent. more water than that not manured. It is evident from this that we must attribute a goodly share of the increased fertility to the increased water content. We have further proof of this in the irrigated fields of southern California, where the poorest soils are, by simply watering them, made to produce the finest of crops. All irrigated lands, regardless of quality, far exceed the highest-manured lands when natural rainfall is depended upon, taking for comparison such plants or trees as are adapted to either climate.

In Kaw valley surface or subsoil, an inch of water will pass through five inches of soil in 20 minutes. On the uplands west and north of the reform school the time was 25 minutes, and in the red subsoil $2\frac{1}{2}$ feet from the surface, the time was 60 minutes. In sample from southern part of Osage county, the top soil took 60 minutes, and subsoil, a sort of hardpan, 25 minutes. It takes an inch of water 70 minutes to pass through five inches of the light, ashy soils of Wilson and Allen counties, and less than half that time to pass through the subsoil. One inch of water will drain through five inches of Arkansas valley soil from Barton county in 10 minutes; at this rate the soil would absorb six inches in one hour.

The soil through which one inch can percolate to subsoil every 20 minutes will certainly take in more of the heavy rainfalls than will a soil through which water flows at rate of one inch per hour. In the latter case, in heavy rains, the waste and washing at surface must be great, and quantity stored proportionally less.

The condition most favorable to storage and retention of moisture is a surface soil that water flows through with reasonable freeness, underlaid with a subsoil of more retentive nature, to arrest the water from draining beyond reach of roots. It is desirable in a climate like Kansas, to have as large a percentage of the rainfall as possible drain at least six inches below the surface, and as small a percentage as possible descend more than four feet. Water will rise by capillarity from three to four feet below the surface to the plant roots six to nine inches below the surface, as fast as necessary to supply that removed by evaporation through the plant in its daily growth. From a greater depth, the percentage would probably be relatively smaller. The top $2\frac{1}{2}$ feet of soil, if not gravelly, sandy, or fissured with seams to drain water freely, will hold and retain seven to eight inches of rainfall at one time. If, below this depth, the soil has 20 to 25 per cent. of moisture, there will be little water pulled from the surface, but if the percentage is less, then that above will be less. It is generally true, however, that a soil cultivated and well stirred has greater surface tension power than soils that have never been disturbed by the plow. Also, that water freshly applied has greater tension than soil water, and, under certain conditions, the fresh water will pull the water in the subsoil towards the surface.

The temperature of the soil is an important factor in the retention of soil moisture. The lower the temperature of the soil, down to 40 degrees, the more moisture it will take from the air, and the higher the moisture content in the first foot of soil. When the soil temperature increases the moisture content recedes from the surface, and decreases in the first foot. High temperature is the chief cause of water waste in soils, and any system of cultivation that secures a lower soil temperature in midsummer months is most favorable to plant growth in this latitude.

When rainfall equals four inches per month, and is equally distributed, fruitful seasons are sure to follow under almost any system of farming in Kansas, but as we neither know the times, or the seasons, or the quantity, the intelligent farmer must direct his best efforts to so manage the soil and the crop that the longest period without rainfall can be tided over with least serious results.

Evaporation is the greatest adverse factor the Kansas farmer has to deal with. In looking over the records of the summer months in this latitude, we find that seasons of high temperature are rarely good crop years, unless the rainfall has been excessive. While it is true that light rainfall and high temperature are coincident, and naturally so, yet some seasons of light rainfall, like 1875, are excessively fruitful when temperature is low.

In the 10 years prior to 1885, the maximum temperature at Manhattan exceeded 100 degrees only once. Since 1885, the maximum has exceeded 100 every season but two; and Kansas has had more unfavorable seasons in the past 10 years than in any other 10-year period of her history.

In considering ways and means to modify the ill effects of high temperature and limited rainfall or water supply, it is important to know how the roots of plants are distributed in the soil. The most thorough and advanced work that has come to my attention along this line is that done by the Wisconsin experiment station. That shows that roots of corn plants reach a depth of four feet, and if the soil conditions are favorable the mass of roots in the third foot is almost as great as in the first foot from surface, and the lateral spread at depth of two feet or more is five to six feet across. Many roots pass laterally far beyond the adjoining rows, making a lateral spread of over four feet on each side of the plant. Roots of wheat, oats and barley go three to four feet down in search of food and water, if conditions are favorable. Red clover roots rarely go over two feet in depth. Timothy roots penetrate three feet; blue grass, 12 to 15 inches. Corn roots, in their natural position, have a spread somewhat like an umbrella, the roots starting from the tip, and those on the outer circumference following a course similar to the curve downward of the umbrella ribs. The roots of adjoining rows meet and pass each other midway between the rows four to six inches below the surface, but close to the corn row the roots are two to three inches below the surface. A cultivator run close to the row and over three inches deep must catch and break many of the leading roots several feet in length, with their great mass of branches, causing widespread injury. It is not safe to cultivate over $2\frac{1}{2}$ inches, close to row, after corn is two feet high, or four inches deep in center, if root cutting is to be avoided.

If corn is listed in rows 3 feet 8 inches apart and 18 inches apart in the row, this will give each plant an area of $5\frac{1}{2}$ square feet. If we allow three feet as the greatest depth the roots will reach, then each plant has $16\frac{1}{2}$ cubic feet of soil over which the roots may range in search of water. If this mass of soil is 20 per cent. moist, it will contain 25 gallons of water, of which one-half will be available for use of plant, and one-half cannot be removed from the soil by the plant roots. The total amount of water in the top 3 feet, 20 per cent. moist, represents $7\frac{1}{2}$ inches of rainfall, and, if none is lost by evaporation, would supply two-fifths of the amount of moisture needed to raise a 50-bushel crop of corn per acre. The remaining three-fifths would have to be supplied by six inches of rainfall, or artificial supply, making over 1,000 tons of water per acre, in all. The seasons are rare when 10 inches of rain does not visit Kansas cornfields during the seasons of growth, and more rare where an average 50 bushels per acre is harvested. In fact, 20 inches of rainfall rarely gives us more than half this yield. The rainfall record of Leavenworth, Independence, Topeka, Wellington and Salina shows average fall of from 18 to 20 inches for the five months, April to August, inclusive, compiled from records from 5 to 50 years. In the same territory, the average corn crop for 33 years is 31 bushels per acre, requiring about 600 tons of water per acre, or six inches of rainfall. In 32 years the corn plant has used about one-third of the rainfall, April to August, inclusive, and the remaining two thirds has either run off or been evaporated. Under average cultivation, the loss by evaporation in Wisconsin is 30 tons of water per acre, daily. In our warmer climate this would be exceeded, and means a loss of an inch of water from the soil every three days, and in the month of July would exceed 1,000 tons of water, an amount sufficient to make over three tons of dry matter, or a crop that we get only from the best farms in the average seasons.

Is it not evident from the facts presented that evaporation is the great problem in Kansas agriculture, and in fact everywhere? There is a remedy for this in the artificial application of water by irrigation, which is by far the best preventive for this evil; but what can those do who have no facilities for irrigation, and are compelled to depend on natural rainfall? We cannot prevent the high temperature of July that robs us of our soil moisture. We cannot produce rainfall to supply the

loss by evaporation. These are both beyond our control; but we can do much to modify the ill effects of a superabundance of heat and limited supply of moisture by our methods of soil culture.

If evaporation is the greatest enemy in crop production, then all our intelligence, skill and energy should be brought into use to weaken its power. Water near the surface of the soil is an easy victim to evaporation; therefore land should be so cultivated as to store the natural or artificial supply of water as far below the surface as possible. This suggests subsoiling and deep plowing, and this is the great purpose in both, to so arrange the soil mechanically as to make it receptive, so that it will take in all the rain that falls as fast as it falls. Ground plowed 16 to 20 inches deep will absorb and retain an inch of rain per hour for several hours; in fact, any rainfall outside of a cloud-burst. It is the best preventive for washing, because the water is run in and not run off. Having captured all the shower, the next most important thing is to retain it for use of plant. This suggests a mulch of dry soil. Dry soil has no capillary power. Water will not rise through it unless the soil below is fully saturated and in contact with excessive supply. By drying out the top two or three inches of soil, evaporation is checked and greatly lessened. The cultivator or harrow loosening the top three inches of soil as soon after every rain or application artificially as the soil can be worked will destroy its capillarity, and, admitting the air freely to the depth stirred, rapidly dry it. A soil compacted by rain or irrigation water is in favorable condition to evaporate the soil moisture rapidly. The greatest loss generally follows immediately after the rain has fallen or the irrigation water has been applied; hence the importance of prompt stirring of soil, and in times when the period without rainfall is prolonged, the surface stirring should be frequently repeated.

This practice should not be limited to the cultivation of corn. It is equally important after harvest of small grains to prevent the land becoming hard. For fall wheat, the plowing should be done in July and the surface harrowed several times before seeding, and especially after every shower of rain. The ground is generally in good condition to plow immediately after removal of wheat or oats, even if no recent rains, but if plowing is delayed 30 days, then the plowing must be delayed until it rains. This makes a double loss. First, loss of moisture left in the soil after grain crop is removed. Second, poor seed bed, because of late plowing. If ground cannot be plowed immediately after harvest, it should be promptly harrowed, making a light mulch, which will retard evaporation till it can be plowed. For spring crops, deep fall plowing, followed in early spring by a shallow plowing, and surface stirring, gives, in my judgment, an ideal condition for storing and saving moisture.

Manures, when fully rotted, increase the moisture content of the soil, and this in turn enables the plant to get the fertile elements out of the soil. Some of these are more soluble than others. Hence, the higher the percentage of water a soil contains the greater the percentage of chemical elements in the soil that will be available for plant use. As the plant takes up the water in the soil and evaporates it through the leaves, it at the same time conveys to the plant in soluble form the food it needs. These soluble fertile elements are arrested and retained by the plant for its growth and upbuilding. The water only is evaporated. We can understand from this the value of artificial watering which enables the husbandman to keep the percentage of moisture in the soil sufficient and uniform, supplying the plant with its daily food in undiminished and unvaried supply. With natural rainfall, the plant sometimes has a feast, sometimes a famine, and this irregularity of drink and diet checks growth and fruit development.

Changes in the moisture content of the soil bring about changes in the feeding

habit of the plant, and these changes are usually injurious. The more uniform the percentage of moisture and temperature, the more perfect the product. Plants are unable to take moisture from the soil where the moisture content is less than 10 per cent. It must have an excess of this amount to grow and mature fruit.

What has been presented here to-day simply suggests how little we know of the foot of soil under our feet, and the great need of more thorough and exact investigation. We can never intelligently interpret results without a knowledge of soil temperature and moisture content during period of growth, in connection with air temperatures and rainfall.

Maryland and Wisconsin so far have led all the other states in investigating the physical properties of soils, and making practical tests by field experiments, and so far we have had to look to the work of Professor Whitney, of the department of agriculture, Washington, and to Professor King of the Wisconsin experiment station, for what information we have on this subject, and, by reason of lower temperature and greater rainfall, the conditions there are scarcely applicable to Kansas.

We need to make investigations for ourselves.

DISCUSSION.

EX-GOVERNOR GLICK: Under what conditions is it necessary to use lime?

MR. HILTON: It is necessary to use lime on very fine soil. I am trying it now on a small scale on a farm in Wilson county. I am putting lime on a part of it with the idea of forcing the particles further apart, so that the water can get through it. That is all the matter with that country. The water cannot get into the soil. I do not know but that it might be a good thing in gumbo. I think it would help gumbo, but it is something that ought to be experimented with carefully.

ED. R. SMITH: Relief would be irrigation in the west and subsoiling in the east?

MR. HILTON: Subsoiling is a good thing everywhere. If you irrigate, your water costs you money. With subsoiling, it is just as important in the west as in the east; of course, if you subsoil and do not get rain enough, you will get no crop. You have to either wet it by irrigation or wait for rain. In western Kansas, if you subsoil and do not get more than five or six inches of rain, you would not get a crop; but if this is done, it would then be in much better shape for the next season.

GEO. H. COOPER: How would subsoiling benefit farming in the West?

MR. HILTON: It would benefit the land in the same way that lime would. By subsoiling, it gives to the whole surface greater tension power.

L. M. PICKERING: What do you think of subirrigation in western Kansas?

MR. HILTON: It is only a question of soil. It is said you can obtain a more uniform supply of moisture. On some soils you can put five inches of water at one time and the plants will almost die before you can get it into the soil, and there are some, like sand, into which six inches will disappear in a few minutes. By subirrigation, you can keep more natural and uniform conditions.

R. T. STOKES: Just one point in regard to reserving the moisture; I happened to have an actual experience in that regard. I had a man plowing a field of corn and told him he must finish the field before it rained. He got to within 13 rows of the west end of the field before it rained. I husked the corn myself, and there was at least 33½ per cent. more corn where he cultivated than where he did not cultivate.

MR. HILTON: Do your subsoiling in the fall, so as to get the benefit of the early spring rains. If you subsoil in the spring you are likely to have trouble.

A DELEGATE: Is there not danger of getting too much water by subirrigation?

MR. HILTON: It ought to be easy to regulate that. You have it fully under your control, and I do not think there is any danger of getting too much water. I am not

advocating subirrigation. I do n't know whether it is feasible or not. In soil like this (indicating) it won't do at all. There are some soils in which it would be a pretty good thing.

T. A. HUBBARD: What kind of a subsoil plow do you recommend?

MR. HILTON: The one with which we can get down farthest in the ground with the least team power.

CIRCULATION OF WATER IN SOILS.

By PROF. MILTON WHITNEY: before the annual meeting of the State Board of Agriculture, January 10-12, 1894.

I was very much gratified by the invitation extended to me, through your Secretary, to come this long distance from Maryland to speak to you of my experiences in the study of soils. I was the more pleased when he told me he would arrange to have me go around and meet some of your progressive farmers; for you are working out problems here in the West which we in the East are watching with profound interest, and I am glad to meet those who are identified in this work, and to have the opportunity of getting, at first hand, some of your experiences. My own work is based very largely upon the experiences of farmers, and you will notice many familiar phrases, and recognize many well-known facts and experiences of your own, although they will be presented in a different form from the every-day appearance they present to you. My methods are very different from yours, but we are studying the same problems from different points of view.

Enough has been done in the application of science to agriculture to show that much practical good has come from what seemed to be the most impractical work. Science is constantly pointing out new forces, which can be used by the farmer for the betterment of agricultural methods and of agricultural products, and this application of scientific thought and methods to problems of practical agriculture has never been more active than at present.

Twenty-five years ago our farmers in the East were getting from \$1 to \$1.50 per bushel for wheat. Never but once, I believe, in the present century, in 1839, had the price of wheat fallen materially below \$1 per bushel. On three memorable occasions, the Irish famine, in 1846-'47, the Russian war of 1854-'56, and immediately after our own civil war, the price of wheat rose to \$2 and \$3 per bushel. Since 1873, however, the price of wheat has steadily declined, having reached its lowest point this year. This decline is generally attributed by our people to competition from the West, made possible by the wonderfully improved facilities of railway transportation; for before this we were in a measure protected, as our local markets had to depend upon the surrounding country, within a few days' hauling distance by teams, while the surrounding country was sure of this ready local market in our cities and towns. Some, indeed, attribute the decline in price of wheat to the demonetization of silver; and others, again, to the present speculative methods of selling the crop. It is beyond the province of this paper to inquire into the real cause, as we are directly concerned with the effects. So sharp has the competition become, that our farmers are very well convinced that they cannot grow wheat with any profit on lands which will not give, under reasonably good cultivation, more than 15 or 18 bushels per acre. Our farmers are beginning to realize that the different soils in the state are not all equally valuable; that they are not all equally adapted to the same crops; that the same methods cannot be expected to yield the same results on all; and that the conditions in each of these soils are particularly adapted to certain kinds of plants. We have learned that the lands which are not adapted to wheat are better adapted to other kinds of crops, but I believe that nothing short of this close com-

petition could have overcome the prejudices and traditions of the past, and have made our farmers give up the cultivation of wheat on these lands which are ill adapted to it, because this had been the practice of our ancestors for generations. We have learned this lesson from you, gentlemen, and have been forced by you to readjust our agricultural system.

Rumors reach us, from time to time, from the West, that these fertile prairie lands of yours are deteriorating, and that they are not so productive now as they were 20 or 30 years ago. I do not know that these rumors are correct, but we are watching you and the development of your agricultural resources with profound interest, hoping to see how you will solve this problem of the deterioration of these virgin lands. Our own lands have been under cultivation for 200 years or more. Another problem you are working out interests us greatly. In our old geographies all of the Western country was classed as the "Great American Desert." Our present maps are dotted over with your towns and settlements, and even the most arid parts are being reclaimed by artificial irrigation, under which your crops are larger and more certain than our own. All of this interests us much, and we are watching you with interest, and are learning from your every move better to understand and appreciate our own conditions and resources.

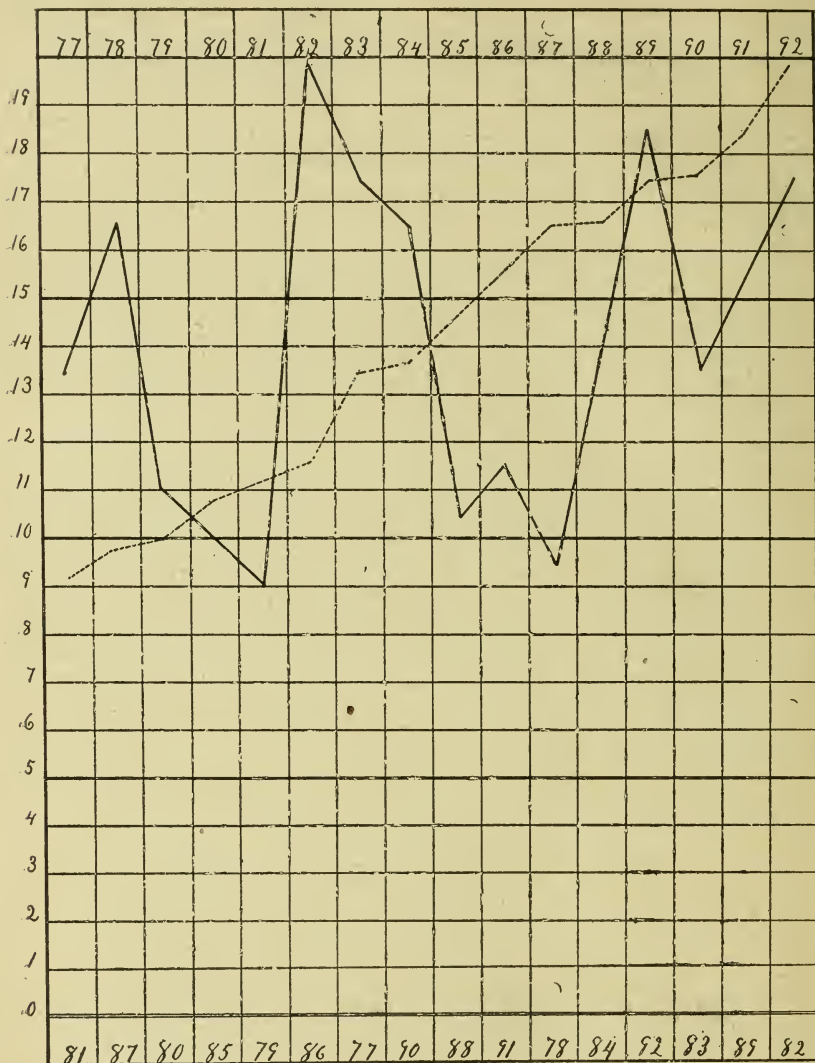
I have come to speak to you of the relation of the moisture of the soil to crop production, and of how this moisture may be conserved in the soil by methods of cultivation, manuring and cropping so as to secure the best development of crops. You can find no more striking illustration of the importance of my subject than in the following table of the average yield per acre of wheat in your state for a period of 11 years, taken from the World's Fair report of your own Board of Agriculture. I have arranged the table in two ways, by consecutive years and in the order of the increased yields per acre, for this will show you that the yields increase quite regularly, about one bushel per acre, and you can see that there are no sudden or exceptional conditions indicated by sudden breaks. These results are also shown in diagrams, which present the matter much more strikingly than the table.

AVERAGE YIELD OF WHEAT AND CORN IN BUSHELS PER ACRE IN KANSAS—16 YEARS..

WHEAT.				CORN.			
Consecutive years.		Progressive yields.		Consecutive years.		Progressive yields.	
Year.	Yield.	Year.	Yield.	Year.	Yield.	Year.	Yield.
1877	13.5	1881	9.1	1877	36.5	1887	14.6
1878	16.3	1887	9.6	1878	33.9	1890	15.6
1879	11.0	1880	10.0	1879	33.0	1881	18.2
1880	10.0	1885	10.6	1880	29.3	1886	21.8
1881	9.1	1879	11.0	1881	18.2	1892	24.5
1882	19.9	1886	11.4	1882	33.7	1891	26.7
1883	17.5	1877	13.5	1883	36.7	1888	27.0
1884	16.5	1890	13.7	1884	36.9	1880	29.3
1885	10.6	1888	14.6	1885	32.4	1885	32.4
1886	11.4	1891	15.5	1886	21.8	1879	33.0
1887	9.6	1878	16.3	1887	14.6	1882	33.7
1888	14.6	1884	16.5	1888	27.0	1878	33.9
1889	18.4	1892	17.4	1889	35.3	1889	35.3
1890	13.7	1883	17.5	1890	15.6	1877	36.5
1891	15.5	1889	18.4	1891	26.7	1883	36.7
1892	17.4	1882	19.9	1892	24.5	1884	36.9

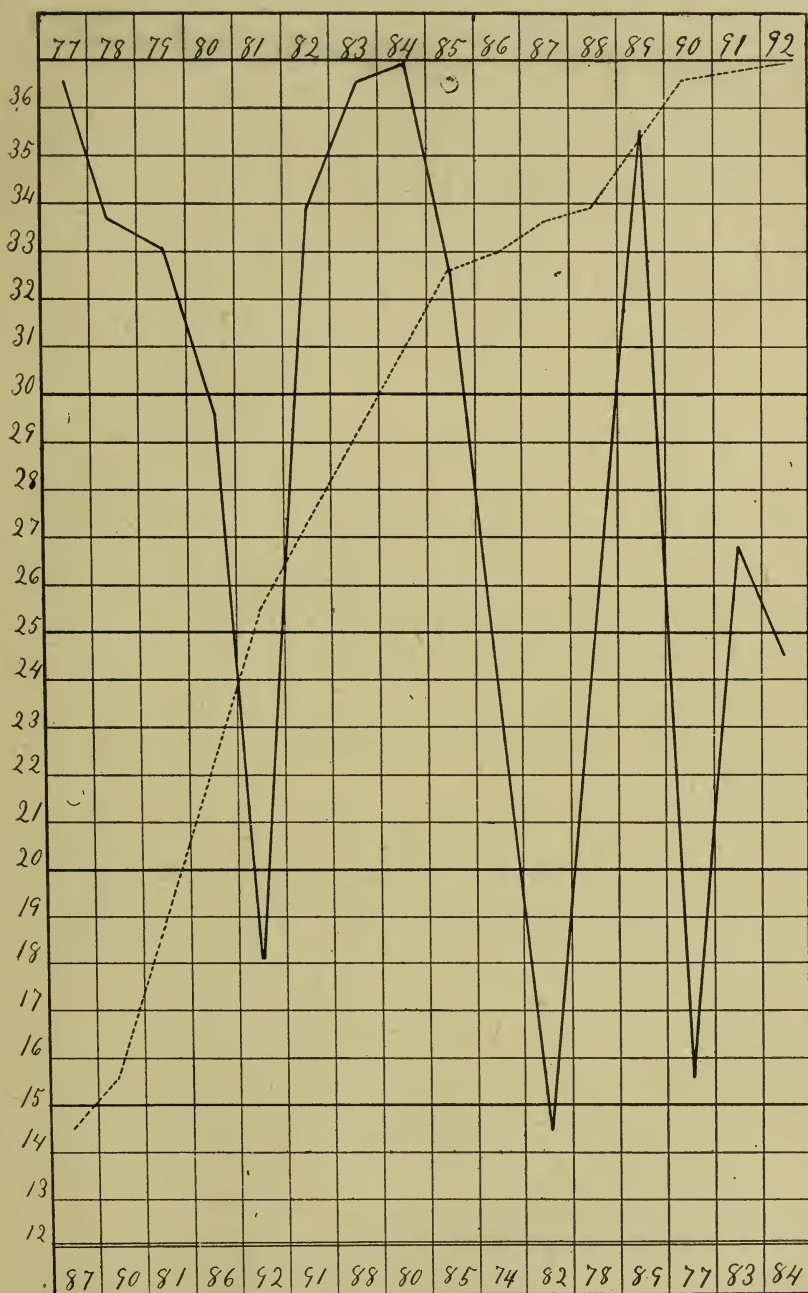
These differences in yield are unquestionably due to differences in climatic conditions in the several years. The conditions in 1887 must have been very unfavorable to have given 9.6 bushels per acre, while the conditions in 1882 must have been

AVERAGE YIELD OF WHEAT, IN BUSHELS PER ACRE, IN KANSAS—16 YEARS.



NOTE.—Black line shows yields in consecutive years; dotted line shows progressive yields.

AVERAGE YIELD OF CORN, IN BUSHELS PER ACRE, IN KANSAS—16 YEARS.



NOTE.—Black line shows yields in consecutive years; dotted line shows progressive yields.

extremely favorable to have given an average yield for the state of 19.9 bushels per acre—more than twice as great as the yield in 1887. Now, it is a general law in the vegetable world that, if any one condition necessary to plant growth be relatively deficient, the growth and development of the plant will be limited by that one factor, no matter whether all other factors are in great excess. For instance, if there is a deficiency of lime, potash, phosphoric acid, or of heat, or of moisture, the growth and development of the crop will be measured by this one factor, and it is useless to attempt to increase the crop unless this factor be controlled. You may add tons of phosphoric acid and of potash to your soil, but if the crop is limited by the small amount of lime it can gather, the excess of these other plant foods will be of no avail. You can add tons of phosphoric acid, potash and lime to the soil, but if either temperature or moisture is the controlling factor, the excess of plant food will be of no avail.

I think that this table and these diagrams prove, beyond question, that the yield of wheat in your state is controlled by climatic conditions. In 1882 the yield was double that of 1887. The low yield of the latter year was undoubtedly due to unfavorable climatic conditions, and if these were a controlling cause then the mere addition of plant food would have had no effect whatever upon the crop, except as they would influence the climatic conditions. In other words, it was not a lack of plant food which limited the crop to 9.6 bushels, but unfavorable climatic conditions. In 1891 the climatic conditions must have been very much more favorable, for there was a yield of 15.5 bushels, and in 1882 the conditions must have been still more favorable, to have given the yield of 19.9 bushels. But who can say, in looking at the regular sequence of these results, as arranged by progressive yields, that in any year the climatic conditions were favorable to the best development of the crop? Can we say, even in 1882, that the climatic conditions were so favorable that the yield of crop was controlled by some other factor? I think not, and if the conditions during this coming season are more favorable than they were in 1882, you may, without any volition on your part, without any improvement of the methods of cultivation, and without any additional care, have a yield far in excess of the best yield in this period of 11 years.

You have here in these climatic conditions wonderfully potent and influential forces, sufficiently powerful to double the crop of your entire state, a crop which, in 1892, was valued at over \$38,000,000. You say that this is a providential dispensation over which you have no control; that you cannot influence materially either the temperature or the rainfall. Let us grant this for the moment; still, you can take advantage of the conditions which prevail and can control and modify these conditions to a very great extent.

The most essential feature of these climatic conditions which has influenced the yield of crop, in this period of 11 years, is, undoubtedly, the amount and distribution of the rainfall during the growing season. Temperature is a very important factor in the development and distribution of plants, but plants can adapt themselves to a wider range of temperature than to the ordinary differences in the rainfall. The rain does the plants no good until it enters the soil and can be absorbed by the roots; so that, in the ultimate analysis of the causes which have influenced the yield in your state, the amount and distribution of the moisture in the soil has undoubtedly been the chief controlling cause.

My friends from western Kansas, you think that we in the East are favored by an abundant rainfall, while you have scarcely 15 or 20 inches a year. I tell you that 40 or 50 inches of rainfall a year is not altogether an unmixed blessing, for the vicissitudes of the rainfall are hard to provide for; and, with the most thoughtful and intelligent care, our lands are either too wet or too dry. The safest and most per-

fect conditions of agriculture to-day, as history shows them to have been in the past, are undoubtedly to be found under the artificial methods of irrigation, where water can be supplied to the plant as needed, so that you do not have to depend upon the uncertainties of the rainfall. This is, of course, largely a commercial question, as it is a matter of very great expense to irrigate, and it is doubtful, in many cases, if the expense would be justifiable; but this is a matter which will work itself out in very much cheaper and more improved methods of irrigation. We, in the East, are looking to you to lead us in this matter; for I think that, for our own safety and protection, we may, in time, have to resort to irrigation, with adequate underdrainage, to carry off the excess of moisture from our excessive precipitations.

Having noticed the importance of our subject, having seen that it is a controlling force sufficient to double the wheat crop of this state, it is important that we should understand and appreciate some of the laws which govern the circulation of water in the soil, that we may better understand how it may be controlled, and devise the best methods of cultivation, and for this we must understand something of the nature and properties of soils.

Plants, like animals, require food for their life and growth. The greater part of the food of plants comes from the atmosphere, but a very important part is derived from the soil. Soils consist of minute fragments of rocks, or minerals, and of the remains of plants and animals. These fragments are classed as gravel, sand, silt, and clay, according to the sizes of the individual particles. Most of the minerals have to undergo some chemical change before the plant foods, especially the potash and phosphoric acid, can be taken up by the plants, and the organic remains of plants and animals, which is the principal source of the nitrogen of plants, has to be entirely changed by fermentation, or rather by nitrification, before it can be used. The soil is a vast storehouse for these mineral foods, and lime, potash, phosphoric acid, nitrogen, and the several other chemical elements necessary for the life and growth of plants, are all very widely distributed, while they are used in relatively small amounts by plants. Soils which contain less than one ton of potash, or of lime, or of phosphoric acid, to the acre, one foot deep, are considered very deficient in these foods, while many soils which are considered, agriculturally, poor and barren have several times this amount of plant food. Most soils contain from 2 to 20 tons of each of these foods per acre. Twenty thousand pounds or 10 tons of phosphoric acid is about the average amount in an acre of land. This is as much as is contained in 1,000 200-pound bags of an ordinary superphosphate. It is strange, indeed, to consider that 20 pounds of phosphoric acid ordinarily applied, when a bag of superphosphate is used to an acre of land, already containing 20,000 pounds of phosphoric acid, frequently makes all the difference between a good crop and a failure.

In our Maryland work, we have found that there is an abundance of plant food in soils which are considered too poor for wheat, and in which the yield of wheat, even under good treatment, is not more than 5 or 10 bushels per acre, and we are satisfied that the cause of this low yield is due to the texture of the soil, which cannot maintain conditions of moisture and heat favorable to the best development of the wheat crop.

The soil is likewise a great storehouse or reservoir, where the water of the rainfall is conserved for the use of plants and animals. Animals obtain their drinking water from springs or streams flowing out from the soil, or from holes artificially sunk into the water-bearing strata of the earth, and from which the water is raised by mechanical means. They can range over a large extent of country for their food and go for their drinking water, when needed, to some local outlet for the water

from the depths of the earth. Plants, on the contrary, are fixed in their position on the earth, and require that water shall be constantly and regularly supplied to them. With us in the East, rain falls, as a rule, on two or three successive days, followed by an interval of six, eight or 10 days of fair weather. The soil has to offer a resistance to the descent of this rainfall, so that it shall be conserved or held for the supply of plants during this dry-weather period. Let us see through what laws the soil thus retards the descent of the rainfall, and so regulates the supply for crops, and see if we have any control upon the same.

One thing which will probably strike you as very surprising is, that while the grains seem to be packed about as closely as possible in the soil, and the soil seems to be about as compact and continuous as it is possible to make it, yet, on the average, about 50 per cent. by volume of the soil is empty space, into which water and air can freely enter. A cubic foot of soil can absorb about half a cubic foot of water without swelling. When a drop of water falls to the ground it spreads out over the surface of the soil grains, enveloping them in an elastic film. The space within the soil is seldom completely filled with water, for this would exclude air, which is necessary for the healthy functions of the plant, but the water forms a film around the grains, and this film has such an important part to play in the movement of the water in the soil that I shall explain its properties at some length.

On the surface of a liquid there is a peculiar force or tension, called surface tension, which causes what many of you will recognize as capillary power. If a mass of water is divided, or cleft in two, leaving two surfaces exposed to the air, the particles of water on either surface, which were before in the interior of the mass and attracted from all sides by like particles of water, have now water particles on one side to attract them, with only a few air particles, comparatively very far apart, on the other side, where formerly was a compact mass of water. All the surface particles of water will therefore be pulled from within the mass of water, and the surface will tend to contract as much as possible, leaving exposed the smallest number of surface particles and causing a continual strain, or *surface tension*. On any exposed water surface there is always this strain or tension, ready to contract the surface when it may. [Illustrated by a soap bubble.]

When a soil is only slightly moist, the water clings to the soil grains in a thin film. It is like a soap bubble with a grain of sand or clay inside, instead of being filled with air, and the film is constantly tending to contract, so as to expose the least possible extent of water surface to the air. The grains in a cubic foot of soil have, on an average, no less than 50,000 square feet of surface area. If the soil is nearly dry, there will be a great extent of exposed water surface over this vast area, and there will be a great amount of surface tension. If the empty space is completely filled with water, however, and the soil saturated, there will be none of this exposed surface, and, therefore, no surface tension. If the cubic foot of soil, slightly moistened with water and having a large extent of exposed water surface, be brought in contact with a body of similar soil fully saturated with water, and in which there is none of this water surface, the water surface in the drier soil will contract and the film of water around the grains will thicken, and water will be drawn from the wet into the dry soil, whether it will be to move it up or down, until there is the same amount of water in the one cubic foot of soil as the other, and the same extent of exposed water surface, and, of course, the same amount of surface tension. I have not considered gravity here, or the weight of water, for this would confuse us with other unnecessary terms.

When water is removed from a soil by evaporation or by plants, the area of this exposed water surface is increased and the tension tends to contract the surface and pull more water to the spot. When rain falls on rather a dry soil, the area of the ex-

posed water surface in the soil is diminished and the greater extent of the water surface below contracts and acts with gravity to pull the water down. This is the power which moves water from place to place in the soil as it is needed. The very fact that water has been used from the soil disturbs a balance of power and sets in operation forces which tend to replace the water from the adjacent soil.

I have found in my investigations that the surface tension, or pulling power of water, is very low in soils. The force on a square yard of pure water surface is sufficient to raise a weight of 120 grains three feet high. The force on a square yard of soil water surface is sufficient to raise 100 grains three feet high. Stable manure, cotton-seed meal, cotton seed, tankage, and most organic substances, decrease this contracting power, and if large quantities of these organic substances are injudiciously used, especially on a light soil or in a dry season, they tend to burn out the land and make it dryer than it would otherwise be, because there is less power to draw water up from below to supply loss from evaporation and that which has been used by plants. Salt, kainit, lime, and plaster, on the other hand, increase this contracting or pulling power of water. They tend to make the soil more moist, because they increase the power water has of drawing more water up from below to replace that lost by evaporation or used up by plants. It is a very common experience that salt or plaster makes the land more moist. We thus see that the power which moves water to the plant, as needed, and to replace the water lost by evaporation from the surface of the soil, resides in the water itself, in this peculiar property the water surface has of contracting to the smallest possible area, and we see that we are able, through ordinary commercial fertilizers, to greatly modify and change this contracting power of water.

Having explained the force which moves water from place to place in the soil and shown that we have some sort of control of it, let us consider what other conditions there are in the soil which will control the volume and weight of movement of water.

I need hardly remind you that, when water is flowing through a narrow tube or small space, the friction against the sides of the space is relatively greater the smaller the space is. [Illustrated by tubes.] We have here 10 tubes, which, together, hold the same volume of water as this single tube in my other hand. If these tubes were all extremely small and of capillary size, water would move through the 10 tubes very much slower than through the single large one under the same pressure, for there is more friction in the 10 tubes, and this retards the rate of flow. Let us see how this applies to the soil. If there are 10 times as many grains in a clay soil as there are in a sandy soil, the empty space in the clay soil will be divided up 10 times more than in the sandy soil, and there will be a great deal more friction, and there will be far more resistance to the flow of water than in the sandy land.

There is usually more space in a clay soil than there is in a sandy soil, so that clay soils, as a rule, will hold more water than sandy soils, because they contain more space. But suppose, for the moment, that they contain the same amount of space; as the water is divided up much more in a clay soil there is much greater extent of active water surface to contract, and so water is held or moved with much greater force in a clay soil than in a sandy soil. At the same time there is far more resistance to the movement of the water, as there is more friction and it moves much more slowly through these fine-grained clay soils than through the coarser, sandy lands. With the same amount of rainfall more of the water would be retained by the clay soil, as it offers a greater resistance, so that the water moves down very slowly, and the soils have greater power of drawing the water up again, as needed, than the sandy soils have. Sandy soils are, as a rule, coarse and open in texture and allow the rain to pass through them very readily. They have little power of

maintaining this moisture for the plants, or of pulling it up from below to replace that lost by evaporation. We find, in the conditions which prevail in Maryland, that our stiff clay soils have, as a rule, four or five times as much moisture as the sandy soils, although the same amount of rain falls over both soils.

Where soils differ as much in texture as these do, the temperature and the amount of moisture within the soil at the disposal of a crop will differ much more widely than the climatic conditions in widely different sections of the country, and these wide differences of climatic conditions *within* the soil undoubtedly have a marked effect upon the development, yield, quality and time of ripening of the crop. We find that the temperature in our light, sandy soil, at noon of a hot, summer day, is 10° or 15° *cooler* than in our heavy, limestone soil. With the same rainfall, the sandy land maintains only 5 or 6 per cent. of water, while the heavy, clay, limestone soil maintains from 18 to 22 per cent. of water.

We have in Maryland, on an average, about four inches of rainfall per month. Our sandy soils will maintain, on an average, so as to be available to plants, about 100 tons of water per acre, equivalent to about one inch, or one-quarter of the rainfall; while our clay soils will maintain, on an average, about 400 tons of water per acre, equivalent to about four inches of the rainfall; so that nearly the whole amount of the rainfall is held and is available to plants on the clay soil.

If two plants were treated as differently as this in a greenhouse, one being given four or five times as much water as the other, the developments of the plants would be very different; or if, during one season, there were four or five times as much rainfall as in the preceding year, the effect on the crops would be greater than could be expected from any application of fertilizers.

There is a broad general rule in the vegetable kingdom, that any decrease in nutrition, of either water, air, or mineral food, during the period of growth, tends to check the growth of the plant and favors the production of fruit and the early maturity of the plant. It is an every-day matter for gardeners and florists to regulate the kind of development and the time of ripening of the crop, or the flowering of the plants, by the judicious control of moisture and heat. They can, by drying out the soil or keeping it dry, force the plants to flower or fruit at will; or, by keeping the soil more moist, they can prolong the growth of the plants, and prevent or greatly retard the maturity and produce a large, leafy development. The same kind of soil can be used for all kinds of plants or for any kind of development, if the moisture and temperature are under perfect control. Our soils, being so different in texture, partake largely of these artificial conditions of greenhouse culture, because they are able, in themselves, to maintain different conditions of moisture and heat.

The retentive power of soils for water depends not alone upon the amount of clay the soil retains, but also, as we shall see, upon the arrangement of these grains of clay and upon the amount of organic matter. The spaces within the soil may be filled up with finely divided organic matter, which would have much the same effect, for the time being, as fine particles of clay, as it would divide up the spaces within the soil and thus retard the movement of water. [Illustrated by tube, with sand, lime, and organic matter].

I have here a tube filled with some coarse sand, from which every particle of clay has been washed out. I have in this bottle an extract of stable manure, which, as you see, is very dark in color. If I should pour this organic matter on to the sand, it would run through unchanged; but I have added a little lime to the upper inch of sand, and if I now pour this extract on the sand, the lime will precipitate the organic matter in light flocks, as you see in this test tube. [Illustrated by test tube, with lime and extract of stable manure.]

The organic matter is thus precipitated from solution in the top inch of sand, and it accumulates there, so as to retard the flow of water; and if I should pour enough of this liquid, the top inch of the sand would become quite dark in color, the organic matter would all be precipitated from solution, and the liquid would come through colorless, and I could make this coarse sand almost impervious to water, as the movement of water would be extremely slow.

You observed that I had to add lime to the sand to precipitate the organic matter. If a soil is deficient in lime, or in iron compounds, an application of lime, or of plaster, or of some similar substance, is necessary after an application of organic matter, to bring out the full effect of the organic manuring.

We thus see that the presence of the organic matter will have the same effect in making the soil retentive of moisture as a large percentage of clay, but if, through constant cultivation and exposure, the organic matter is oxidized and used up, the lands will become more and more sandy in texture and less productive. A heavy clay soil is therefore stronger, more certain and more lasting than a virgin soil depending for its retentive powers and for its fertility upon the accumulation of organic matter. This is probably very important in the consideration of the reasons for the deterioration of these fertile Western prairie lands. When the organic matter in them becomes oxidized and used up, they will be less retentive of moisture and for this reason less productive than formerly.

I have said that the movement of water in soils is dependent not only upon the amount of clay and organic matter in the soil, but upon the arrangement of the grains of clay, and as this probably explains the cause of the deterioration of many of our once fertile Eastern lands, let us see what effect this has upon the soil. Let us go back and use the tubes again for illustration. Suppose we have 10 tubes, each of the same size, and 10 other tubes of different sizes, one being very large and the other nine exceedingly small. If the total volumes of these two sets of tubes are exactly the same, and if they are all so small as to be of capillary size, water will flow through the set containing the large tube and the nine small ones very much faster than it will flow through the set of tubes of equal size. Similarly, if the grains of sand and clay in the soil are so evenly arranged as to make the spaces nearly uniform in size, the soil will be much more retentive of moisture and water will move through it much more slowly than if the grains were unevenly arranged and the spaces of unequal size. Fertilizers have a great effect upon this arrangement of the soil grains, as you will see in these tubes. [Illustrated by showing flocculation of clay by lime and ammonia.]

I have in this beaker some clay in suspension in water. This has been standing throughout the lecture, and you see the clay is still held in suspension, as the liquid is very turbid. If I pour a quantity of this into another beaker and add some lime water or an acid, you will see the clay gather together in loose flocks and quickly settle to the bottom, leaving the liquid above it perfectly clear and transparent. This is called "flocculation," because the clay flocks together like curdled milk. Ammonia tends to prevent this flocculation and to keep the clay in suspension for weeks, or even months and years. If I had added too great an excess of lime or acid to this turbid liquid, a few drops of ammonia would have pushed the clay particles apart and they would have again become suspended in the liquid and have rendered the water permanently turbid. These fertilizers have the same effect upon the soil. [Illustrated by tubes with soil and lime and ammonia.]

In these tubes I have a soil through which an inch in depth of water will pass in about 100 minutes. Just before the lecture I applied some lime to the surface of one soil, and added some caustic ammonia to the water which is passing through

the soil in the second cylinder. The water was then passing through each soil in about the same time, but the effect of the lime and the ammonia has been very remarkable. In the tube which had the application of lime the water goes through now in considerably less than 100 minutes, so that the effect of the lime in this case has been to materially hasten the movement of water through the soil. In the tube where the ammonia was added, on the contrary, the flow of water has been greatly retarded, so that, instead of going through in 100 minutes, as formerly, if the ammonia is allowed to act for some time the soil becomes almost impervious to water, which flows so slowly that it may require many days for an inch of water to pass through.

Where the lime was applied to the soil the small grains of sand and clay were flocculated and drawn close together, so that some of the openings or spaces in the soil were made larger and others were made very much smaller. The effect of this, as we saw illustrated in case of the tubes, is to make the water flow more rapidly. The ammonia, on the other hand, had just the opposite effect, and pushed the small grains of sand and clay farther apart, so that the spaces in the soil are of more uniform size, and, as we saw in the case of the tubes, the movement of water would be greatly retarded. These experiments serve to illustrate the powerful physical effects of fertilizers on soils in changing the arrangement of the soil grains and the relation of the soils to water.

We have in Maryland a great variety of soils, each adapted to particular crops, and we have very varied agricultural interests. We have learned, through competition from the West, or we have come to realize the fact, that our soils are not all of equal value, but they are each best adapted to certain crops, and we are finding now that the reason of this is not that the plants find different kinds or amounts of plant food in these different soils, but that the conditions of moisture which each soil can maintain are peculiarly adapted to certain kinds of development.

Our wheat and grass now are confined to those lands containing over 20 per cent. of clay, for we find that this percentage of clay is necessary to make the lands sufficiently retentive of moisture to give the even and prolonged growth necessary for the best development of our wheat and grass. Our best tobacco lands have from 10 to 20 per cent. of clay. If the soils have more clay than this they are too retentive of moisture, and the grade of tobacco produced is large, coarse in texture, and sappy. The production of early truck and vegetables is confined exclusively to those lands having from 3 to 10 or 12 per cent. of clay, because these soils are unable to maintain much moisture, and the dry conditions force the plants to an early maturity, when they bring a high market price.

I think that you should find out how many different kinds of soils you have, where they are located, and what is their area; then find out exactly what the conditions are in them, and what class of plants and what kind of development these conditions are best suited to promote. It is only by this intelligent study of your conditions, opportunities, and powers, and by this kind of specialization, that you can hope to compete in the markets of the world. I see that you are doing this to a certain extent, in the introduction of alfalfa to take the place of the red clover of the East, which is not so well suited to some of your lands. I am glad to see this appreciation of the peculiar conditions of this locality, and I congratulate your Secretary for encouraging and urging on this special crop, which seems well adapted to your peculiar conditions. But you must not be satisfied with this; you must go on and study your conditions more closely. Where the yields of wheat and corn fall below the limits of profitable cultivation, owing to the peculiarities of climate or the conditions in the soil, you must abandon the cultivation of these crops, as we have done in the East, and must find other crops which will be better adapted to the pre-

vailing conditions. You should have prepared a soil map of the state, showing the area of the different soil formations, the limestones, sandstones, etc., and then study the conditions actually existing in each of these soils, to see what crops they are best adapted to grow. We have prepared such a soil map as this for Maryland, showing the areas of lands adapted to our different crops and different agricultural interests, and we find this of great value.

We have in southern Maryland a large tract of land which was once exceedingly fertile and devoted to the cultivation of wheat and tobacco. Through the use of the high-grade fertilizers and guanos on the tobacco crop, and the clean system of cultivation which prevailed, these lands have deteriorated, and now this is one of the poorest sections of the state, and is a byword of all that is poor in farming. We find that the deterioration of these lands is due to a rearrangement of the soil grains. The grains of clay and fine sand have been pulled together, so that they have not their due effect in retarding the flow of water. Some of the spaces have been made much smaller, and others are larger, so that the soils do not offer the same resistance to the rainfall, and they are unable to maintain sufficiently uniform conditions of moisture for the best development of crops. To permanently improve these soils, the grains of clay must be pushed out so that they will offer more resistance to the flow of water, and the soils be made more retentive of moisture. It has been shown that water moves through these soils 10 times faster than it would if the grains of sand and clay were properly arranged. This, I think, has come about through poor management.

We have also in Maryland a range of clay hills, which are so impervious to water that it requires 5 or 10 times as long for a quantity of water to flow through them as should be required if the grains of sand and clay were properly arranged. The trouble with these lands is, that the grains of clay are so uniformly distributed that the spaces within the soil are of nearly uniform size. This offers a very great resistance to the flow of water, and the movement of water through them is so slow that the conditions are unfavorable for the best development of agricultural crops. These lands need lime, or some other similar substance, to flocculate the clay and cause a rearrangement of the soil grains.

You will have to look out for this in the cultivation and cropping of your own lands. I think there is reason to believe that these Western lands, as a rule, are more retentive of moisture than lands of a similar grade in the East. I think this may be due in part to more organic matter than our older agricultural lands contain, but I think it must be due in large part, also, to a more uniform arrangement of the soil grains in these Western soils, which causes them to offer a greater resistance to the rainfall, and makes them more retentive of moisture. This arrangement is liable to change, as I have said, through cultivation, and I think that the deterioration of these Western lands will come through such a rearrangement of the soil grains rather than through the actual amount of plant food removed by the crops.

Let us apply what has been said to a matter which I understand gives you serious concern—the occurrence of drought during the growing season, which, with your dry winds, quickly dries out the soil and injures the crop. For the solution of this problem, or for any intelligent advice on it, your conditions would have to be carefully studied and your different types of soils treated separately, according to the conditions which prevail in them. In a class of soils which are light and porous and are not sufficiently retentive of moisture to maintain an adequate supply for the crop, there are two ways in which the soil can be made more retentive of moisture, as I have already explained in the course of this lecture: (1) By depositing organic matter within the soil spaces; and (2) by rearranging the soil grains so that the clay will have more effect in offering a resistance to the descent of the rainfall. This can be

accomplished through intelligent methods of cultivation, manuring, or cropping, if the actual conditions are known.

If it is found that there is not sufficient clay in the soil to offer the proper resistance to the rainfall, that is, in Maryland if we should find less than 20 per cent. of clay, the chances are that it would not be possible, in any economical way, to change the arrangement of these grains so as to make the soil sufficiently retentive of moisture. Where there is more than 20 per cent. of clay, we think it would pay with us to make the soil sufficiently retentive of moisture for wheat. If there is less than 20 per cent. of clay, our farmers would not attempt to grow wheat, for it would be too expensive to maintain the conditions in such a soil suitable to the need of the crop. Such lands as these we devote to other crops to which the conditions are better adapted; for instance, to tobacco, fruit, and early truck or vegetables. These light lands, which were formerly considered the very poorest in the state, have now the highest market value.

If you have a class of soils which are too close and too retentive of moisture, these may also suffer from drought, as the movement of water within the soils would be too slow to supply the needs of a crop. Such soils should be made less retentive of moisture, and the soil grains be rearranged by judicious methods of cultivation, manuring, and cropping, as suggested in the course of my remarks. So you see there is no broad, general rule that can be given, for the improvement of the soils would be on entirely opposing principles, according to the conditions which prevail; just as physicians cannot prescribe intelligently or successfully without knowing what ails the patient or judging of his ailment from the effects which are apparent.

You need, as I have said before, to have a thorough study made of your different types of soil. You need to know the percentage of sand, silt, and clay, and the arrangement of the grains, which can be readily determined, and if the arrangement is not such as to give the best effect, it is possible to change this arrangement and to change the relation of the soil to water; or, if it were deemed inexpedient to maintain conditions for a particular crop, some other crop could be selected better adapted to the actual conditions which prevail. This would be a matter for your experiment station or the agricultural college to advise you in.

To sum up what has been said:

1. Differences in climatic conditions and changing seasons have far more effect on the development and yield of crops than fertilizers have.

2. The texture of your different soils are very different, and there is a great difference in the conditions of moisture and heat maintained by these soils; the development and yield of crops on these different soils is largely dependent upon these conditions of moisture and heat which they maintain.

3. The relation of these soils to moisture and heat is largely dependent upon the amount of clay and of organic matter and upon the arrangement of the soil grains. We have in our ordinary fertilizing materials very powerful and potent means of maintaining or of changing these conditions, and it is to this physical effect, rather than to the amount of plant food they supply, that the principal effect of fertilizers is due.

4. The deterioration of agricultural lands may be due to the loss of organic matter or to a rearrangement of the soil grains, changing the relation of the soil to moisture and heat.

5. This does not detract in any way from the value or importance of commercial fertilizers, but only explains their action on a new basis from that generally accepted.

6. It is necessary to understand fully the conditions which prevail in your different soils to understand what classes of crops they are adapted to, and what kind of cultivation and fertilization is best adapted to the conditions which prevail.

DISCUSSION.

H. R. HILTON: The conditions are very different here from those in Maryland. Professor Johnson, of Yale, tells us that when the air is humid to the point of saturation, the plant draws very little moisture from the soil, but, as the air becomes drier, the plant requires proportionately more moisture from the soil, and *vice versa*. The humidity of the atmosphere is the pump handle. If the season is very dry, more water is required at the roots of the plant to supply the demands of the air upon it; so that here in Kansas we have conditions to contend with which do not exist in the state from which Professor Whitney comes. The great problem with us is, how to conserve moisture. Professor Johnson estimates that a full-grown corn plant will take from the soil an average of three pounds of water per day. In our Kansas climate, and with much larger cornstalks, a much greater quantity than this will be required. As already stated, our great problem is, how to conserve the rain water that has found its way into the soil and use it to the best advantage during the growing season. Permit me to illustrate this problem, as well as I can, on the blackboard: The top soil is usually plowed about eight inches deep. Beneath that we generally find a compact subsoil. Our annual rainfall at Topeka is 30 to 35 inches; at Manhattan and Junction City, from 25 to 30 inches, gradually diminishing as we go westward, till the smallest rainfall, of 16 to 20 inches, is reached at the west state line.

Irrigation, to supplement our rainfall, is desirable and important, but no farmer is justified in spending one cent for irrigating his land so long as he allows one drop of water to run off the cultivated land on his farm; nor has he done all he can do for his farm, or justice to the natural supply, until every drop of rain that falls on his cultivated land is received into the soil and kept there. This point needs to be emphasized. It means much in the best seasons — a great deal in the driest ones.

During May and June, we often have very heavy showers in this part of the state, in addition to an average rainfall of four to six inches for each of these months, and at these times the soil becomes supersaturated. While the rain is falling, the cultivated soil may take it in for a time as fast as it falls, until fully saturated, but the more compact subsoil, while able to absorb it all, if given time, cannot do so fast enough, and the surplus begins to run off at the surface, often carrying the finest soil away with it.

I am a great believer in and advocate of subsoiling for most of our Kansas farms. Heretofore the greatest obstacle to subsoiling has been the expense, most of the plows being horse killers, if put in the ground deep enough to be a real benefit. Mr. A. B. Perine, a blacksmith of Topeka, has spent 12 years in perfecting a subsoiler, that undoubtedly comes nearer making subsoiling possible to the ordinary farmer, with ordinary team power, than any implement for this purpose yet designed.

There is probably no soil in the state that needs subsoiling less than the Kaw valley, and yet a number of our best farmers in the valley, near Topeka, are using subsoil plows, with profit. If it is beneficial to plow such land 20 inches deep, how much greater must the benefit be on the drier upland soils of Kansas.

After long study and many glass-tube experiments, confirmed by results in actual practice in the field, I am fully convinced that most of our Kansas lands should be plowed at least 20 inches deep. Where the subsoil is stiff, it may not be possible to plow so deep at once, but it can be done in time. When we get the soil loosened once to a depth of 20 inches, we have established a reservoir there, and then we have the soil loosened deep enough to take in all the rain that ever falls at one time, with very rare exceptions.

This question of subsoiling and water storage is, in my judgment, very impor-

tant to successful crop growing in the state of Kansas, whether the natural rainfall or irrigation is the source of supply. If we get the rainfall into the subsoil by having 20 inches of loosened surface to take in and hold all the rain till the subsoil can, by absorption, gradually relieve the upper soil of its surplus water, this water stored in the subsoil will be taken back again by the roots of the plants as needed. We thus establish a large reservoir of moisture, from which the roots of the plants can draw new supplies, surface tension being the force nature furnishes to convey the water from the subsoil to supply the deficiency constantly occurring where the plant roots are feeding and constantly exhausting the supply.

A word about plowing: Furrow after furrow is turned over, eight inches deep. If subsoiler follows, in a hard subsoil it may break up in large lumps, with wide cracks between. The fine surface soil turned over on top of this will fill up these wide spaces, increasing its power both to pull water down from above while raining and up from below when the surface water is drained off or evaporated. I prefer summer plowing, because then we get more fine, dusty soil to turn under, and the more finely pulverized soil we can bury deep down the more moisture will be gathered deep down where the roots should grow, and where the sun and wind cannot so readily remove it. Professor Whitney has shown that the soil having closest arrangement of soil particles, and most in number in a given space, will hold the most water, and will also have the greatest power to pull water from any direction—up, down, or laterally. Finely pulverized soil is a good pump, and where you want the moisture in the soil pulled to, there you want to put this pump. If you want all the moisture at the surface, the pump should be so constructed as to draw the water to the surface. This you can do by making the soil fine on top, by repeated rolling and harrowing, but under this treatment evaporation will be rapid. Such preparation gives an ideal seed bed, but develops the roots near the surface. Under these conditions, plants are easily injured by dry weather. But if you want the plant roots to develop deep down in the soil, where they will not be exposed to sun and wind, then you must strive to get the finest soil down four to six inches below the surface.

Where the finest pulverized soil is, there the highest percentage of moisture is, and there the roots grow most and develop best. Sun, air and frost are the greatest agents in preparing the soil for plant use. These are all pulverizing and fining agencies. No implement has ever been devised that will take the place of the plow, because this implement alone completely overturns the soil, burying as deep as the plow runs the surface soil, on which sun, wind and frost have been acting, and bringing to the surface fresh soil to be acted on by nature's agent, supplemented by the implements of man, to be again turned under, ready for use of the plant. This suggests that the value of the roller is just ahead of the plow and not after it, and just ahead of the the cultivator or harrow and not following them. The ideal condition is to make the texture of the soil, where the roots are to grow, as fine as possible and as uniform as possible. This means thorough surface cultivation in summer or fall, the fine or dusty soil to be buried by harrow, cultivator or plow as fast as made, to prevent its being blown away. There are some soils that can only be cultivated in spring—because of their lightness after freezing—where this practice cannot be applied. There are coarse, sandy soils that subsoiling might injure rather than benefit, unless there is a stratum in subsoil that needs loosening to allow the water to pass through readily. But over 90 per cent. of all the lands in Kansas are of a character to admit of subsoiling, and will be benefited by deep plowing.

Professor Whitney has called our attention to the great surface tension of pure water. When looking for rain during a dry period, how often we have noticed that a light shower would come along, just sufficient to lay the dust and wet down about

an inch, and we would congratulate ourselves that we had relief, but 24 hours later scarcely a trace of the rain could be seen, and the corn seemed to be in worse condition than before the rain fell. It seemed to leave the ground drier instead of more moist. This pure water, falling in limited quantity on a soil very deficient in moisture, and this little impregnated with organic matter, has, by its greater pulling power, a tendency to rob the soil of the moisture it had by pulling it up from below and bringing it in contact with the warm and dry air. Is that correct, Professor?"

PROFESSOR WHITNEY: The rain water is much purer than the water below, and the surface will contract and draw up the water from below, and leave it drier than before.

MR. SUTTON: How about harrowing?

MR. HILTON: That is good, but the roller ought to go ahead of the harrow, because the dust will keep blowing away, and every particle of dust you make should be buried down deep. A good harrow will bury the dust; but whether you plow, harrow, or cultivate, make all the finely pulverized soil you can and turn it under bringing to the surface that soil from which the water has dissolved and roots extracted the finest particles, to be again acted upon by the elements and prepared for the fining process and use the next season.

A word of caution: I would not advise subsoiling any ground in the spring or summer that is intended to be seeded to wheat in the fall of same year. If soil is broken up or loosened 20 inches deep in the spring or summer, and the season should be dry, the arrangement of the soil grains may be so loose that the moisture in the subsoil cannot be pulled to the surface, and the roots of the wheat cannot reach down to the moist subsoil below the plowing. Would recommend the summer and fall seasons for subsoiling (except in soils that blow badly in winter), and follow subsoiling with a deep-rooting spring crop, like corn, sorghum, etc. One season of cultivation will fill up the interstices in the subsoil, so that surface tension can act on all the soil surfaces to pull water from below, as needed, to supply the exhaustion at the plant roots. I believe in shallow cultivation just before seeding, or while crop is growing. Plowing for fall wheat should be done in July, if possible, and as you approach the seeding time, let each cultivation follow the roller, and be a little shallower. Professor Georgeson has in recent articles shown us how the roots of corn extend between and across the rows, and condemns the deep-toothed cultivator, because it breaks up so many of the feeding roots. With this I agree, and believe the use of double cultivators after the roots begin to develop is a mistake. Their greatest usefulness is as weed killers. After weeds are subdued, shallow-toothed or knife cultivators, to keep the surface loose and as near like a mulch as possible, to conserve the moisture and prevent its waste, are more desirable. Until the corn has tasseled and the crop is practically made, the soil between the rows should not be allowed to become compact or hard, because a compacted soil is a water-wasting soil; and at no time does the corn plant need so much water, or suffer so much for want of it, as just at the blooming period. This may require the use of single-horse cultivators, to loosen the surface again after heavy rains which come after the corn has been "laid by."

MR. WILLIS: I had in contemplation the planting of apple grafts next year. It will take two years to raise a crop. I had intended to subsoil, but, as I understand your discussion of that question, it is unfavorable to such a move unless done the year preceding.

MR. HILTON: Not necessarily in the case of trees. You put your roots down in the soil, 12 or 15 inches, and your trees will thrive all right, and you can then subsoil deeper on each side of your trees.

MR. WILLIS: You think it would be favorable?

MR. HILTON: You are safe in going down 12 or 15 inches in a retentive clay.

WATER REQUIRED TO PRODUCE A POUND OF DRY MATTER.

By PROF. F. H. KING, of the Wisconsin Experiment Station. From tenth annual report of the station.

Before we can understand the importance of conserving the moisture which comes to our fields through natural atmospheric agencies, we need to see very clearly what relation this amount holds to that which is actually required for the production of good crops of different kinds, and, because of this need, efforts have been made during three consecutive years to learn how much water is required to produce a pound of dry matter by some of our leading crops.

In all of these experiments the aim has been to place the several kinds of plants under trial, in as nearly normal surroundings and conditions as was possible; and to this end they have all been grown in fields of their kind, in the same soil, placed always at the level of the field surface, but the soil has been in cylinders so arranged that they could be accurately weighed from time to time, and water added as it was needed. Barley, oats and clover have each been tested in duplicate during two years, corn during three years, and field peas one year.

AMOUNT OF WATER USED BY BARLEY.

In the experiments with barley, during the two years, the average amount of water required for one pound of dry matter was 392.89 pounds, and the average yield of dry matter per acre was 5.42 tons; but the yield in the field was only 2.08 tons. The soil in the cylinders in which the barley grew contained, at seeding time, the same amount of water as did that of the field, but there was added to the soil in the cylinders, at the rate of 1,321.7 tons of water per acre, more than fell as rain upon the fields during the growing season. That is to say, 2.74 times the amount of water which fell as rain upon the surrounding fields was put upon the barley in the cylinders, but we obtained

$$\frac{5.42}{2.08} = 2.61$$

times the yield per acre where the larger amount of water was used, and, so far as we can at present see, under otherwise less favorable conditions. We had in the field a yield of about 40 bushels of barley to the acre, and in the cylinders 104 bushels, with relatively less soil in which the roots could feed, but with much more water supplied at the right time.

AMOUNT OF WATER USED BY OATS.

The average amount of water required for a pound of dry matter of oats in Wisconsin, as found from three trials, was 505.7 pounds, and the average yield of dry matter per acre was 4.26 tons, while in the field it was 3.04 tons. In these trials, as with the barley, the soil in the cylinders contained the same amount of water in the spring as did that in the field, but there was added to the soil in the cylinders

$$2,186.98 - 779.6 = 1,407.38 \text{ tons}$$

of water per acre more than fell upon the fields during the growing season. That is to say, 2.8 times the amount of water which fell as rain upon the surrounding fields was put upon the oats growing in the cylinders, but we obtained

$$\frac{4.26}{3.04} = 1.4 \text{ times}$$

the yield per acre where the larger amount of water was used. The yield in the field was 70 bushels per acre, and in the cylinders at the rate of 98 bushels.

SEEDING TO CLOVER WITH BARLEY OR OATS.

It will be observed that the oats did use much more water per pound of dry matter than did the barley, and as the amount of dry matter per acre produced by oats

is, on the average, greater than that of barley, the oat crop leaves the field much dryer at the end of harvest than does the barley crop. To illustrate, a yield of 75 bushels of oats to the acre will require about 1,538 tons of water to produce them, whereas a yield of 40 bushels of barley will need only 816 tons or 722 tons less. In the report of this station for 1892, p. 122, is given, in tabular form, the amounts of water left in the soil of adjacent barley and oat plots at the close of harvest, and from this table it appears that the barley field contained 291.4 tons more water per acre in the upper four feet than did that of the oats, and it is this strong drying influence of the oat crop on the soil which makes it more difficult to procure as good a stand of clover as with barley.

AMOUNT OF WATER USED BY CLOVER.

The average amount of water required for a pound of dry matter of common red clover in Wisconsin was found, for an average of three trials during two years, to be 452.86 pounds, and the mean amount of water per acre was 2,193.95 tons, producing an average of 4.8 tons of water-free dry matter, or 5.7 tons of hay having the mean per cent. of water usually given in feeding tables, but the amount of water used per acre was

$$2,193.95 - 1,195 = 998.95 \text{ tons}$$

more than the mean total rainfall of April, May, and June, and so far as we now know the larger yield was due to the larger amount of water supplied.

THE AMOUNT OF WATER USED BY CORN.

Of the three seasons which have been devoted to the study of the amount of water required for a pound of dry matter of corn, two were given to dent corn, a strain of Pride of the North, and one year, 1893, to a variety of flint corn; and it appears from the results that the flint corn uses less water for a pound of dry matter than does the dent; for this reason the two varieties will be considered separately.

Water used by Dent Corn.—The average amount of water required for a pound of dent corn, water free, given by two trials in 1891 and two in 1892 is 309.84 pounds, and the mean amount of water consumed was at the rate of 2,916.95 tons per acre, producing a yield of 9.76 tons of dry matter.

During the same two years the field yields of dry matter per acre of the same variety of corn give an average of 3.81 tons, making a difference in yield of

$$9.76 - 3.81 = 5.95 \text{ tons;}$$

but, to obtain this difference of yield, the water content of the soil was held nearly up to that which it had at planting time; and to do this, water was added at the rate of 1,383.5 tons per acre more than that which fell as rain during the growing season upon the fields in which the trials were made.

Water used by Flint Corn.—During the summer of 1893, flint corn was grown in four cylinders in the manner described in the report of this station for 1892. In this experiment an effort was made to learn whether or not less water was used for a pound of dry matter on manured than on unmanured ground. To this end the four cylinders were made to constitute two pairs, in each of which one cylinder was given a dressing of barn-yard manure, placed five inches below the surface. In the table below are given the amounts of water used by the two varieties of corn in the eight trials, where they may be readily compared.

TABLE showing the amount of water required for a pound of dry matter of corn in Wisconsin.

DENT CORN.	Pounds of water used.	Pounds of dry matter produced.	Pounds of water per pound of dry matter.	Computed yield per acre, Pounds.	Computed amount of water used.	
					In tons per acre.	In inches.
1891—1.....	300.45	1.0152	295.95	.....	.....	.....
2.....	298.65	.9727	307.03	19,845	2,991.53	26.39
1892—1.....	235.96	.9905	*238.22	.....	.....	.....
2.....	225.24	.5657	398.15	19,184	2,842.37	25.09
Averages.....	.....	.....	309.84	19,515	2,916.95	25.74
FLINT CORN.						
1893—1. Not manured.....	316.44	1.364	232.0	33,620	3,900	34.42
2. Manured.....	314.64	1.409	223.3	34,730	3,878	34.23
1893—1. Not manured.....	172.94	.3855	223.0	9,505	2,131	13.06
2. Manured.....	234.89	.9125	257.4	22,540	2,895	25.56
Averages.....	.....	.....	233.9	25,099	3,201	26.82

The corn in the two cylinders constituting the lower pair in the table of flint corn did not do well, and apparently because the soil was too wet when it was put into the cylinders. They were all filled the same day, but these stood on lower ground, and the soil was considerably more moist. It is this lack of perfect development which causes the difference in the yields and in the amount of dry matter produced per pound of water consumed.

Taking the average of the four cases, it will be seen that 233.9 pounds of water were required to produce one pound of dry matter of flint corn. Water was used at the mean rate of 3,201 tons per acre, and a yield of dry matter of 12.05 tons to the acre was produced, as against 4.4 tons in the surrounding field, which was itself a large yield, for it produced 66.95 bushels of kiln-dried shelled corn per acre. In the two cylinders in which the corn did best there was a mean yield of 17.09 tons to the acre of dry matter, an amount almost four times that in the field, and the average yield was 2.7 times as large. The difference between the amount of rain during the growing season and the water which was used by the two cylinders giving the largest yields was

$$3,899 - 1,472 = 2,427 \text{ tons}$$

per acre, or 2.65 times as much as the rainfall of the field, and the average amount used by the four cylinders was

$$3,201 - 1,472 = 1,729 \text{ tons}$$

per acre, or 2.2 times as much as fell as rain during the growing season.

It was stated in the opening paragraph of this section that before we can fully appreciate the importance of conserving the moisture which comes to our fields through natural atmospheric agencies, we need to see very clearly what relation this holds to the amount which is actually demanded in order to produce large yields with our several crops. It will help in realizing this important relation if the results which have been given on the preceding pages are brought together in a condensed table, as given below:

TABLE showing the amount of water required to produce one pound of dry matter, and the relation the experimental yields and water used hold to the field yields and the season rainfall.

CROPS.	Pounds of water for one pound dry matter.	Times the season's rainfall.	Times the field's yield.
Barley required.....	392.98, and the water used was	2.7, and gave	2.6
Oats required.....	505.70, and the water used was	2.8, and gave	1.4
Clover required.....	452.86, and the water used was	1.9, and gave	2.4
Dent corn required.....	309.84, and the water used was	1.8, and gave	2.6
Flint corn required.....	233.90, and the water used was	2.2, and gave	2.7
Average.....	.....	2.28	2.34

From this table it is seen that, under the conditions of the several trials, the crops experimented with were able to utilize, on the average, 2.28 times the water which fell as rain during the growing season, and that, in having it to use, yields averaging 2.34 times what are called large field yields were produced.

It does not, of course, follow, from these experiments that well-tilled fields, if irrigated properly, will produce such yields as those recorded here; neither does it follow, necessarily, that these large yields owe their excess over normal crops simply to the extra supply of water added at the proper times. I believe, however, it does follow from these experiments that, were our water supply under better control and larger at certain times, our field yields would be much increased if not actually doubled. It does follow, also, that well-drained lands in our state are not supplied naturally with as much water as most crops on them are capable of utilizing, and hence that all methods of tillage which are wasteful of soil moisture detract so much from the yields per acre. What we call good average yields per acre are determined, in a large measure, by the amount of water which is available to the crop during its growing season, and what we call good yields would be much larger under a larger supply of moisture applied at just the right times.

FRUIT AND VEGETABLE GROWING UNDER IRRIGATION.

By C. H. LONGSTRETH, Lakin; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

In the spring of 1880, I went into Kearny county for the purpose of constructing or helping to construct an irrigation canal, taking the same from the Arkansas river. The tract that our canal covered and was supposed to water comprised about 25,000 acres. At this time these lands had very little if any money value—they were simply used for grazing and were considered worthless for agricultural purposes. It was supposed by many people that the soil was sterile, and would not produce anything, even when watered. But having good reasons for believing that the soil was all right, and rich in organic matter, and having all material necessary to produce plant growth, I had all faith that with sufficient water these lands could be made to produce abundantly of both agricultural and horticultural products. Through want of experience and money combined, our ditch building made slow progress. It was not till the spring of 1884 that we succeeded in getting in shape to furnish water for irrigating purposes. During the fall of 1883, I had succeeded in getting three or four practical irrigation farmers from Colorado interested far enough to come in and locate land under our ditch, they taking government land under the homestead act, this being the first settlement attempted under our ditch. I made a homestead filing myself at this time, which Uncle Sam has since given me a deed to, and is where I now live.

The first farming done on these lands was in 1884, and this on newly broken sod. I had secured a few bushels of alfalfa seed and distributed it among the settlers for trial; this, with what garden vegetables could be planted, comprised the farming operations for 1884, all of which gave very satisfactory results, and encouraged more extensive farming for the coming season of 1885, at the end of which season the growing of many crops ceased to be an experiment. Alfalfa was an assured success; most all kinds of vegetables planted had done so well that we considered we were out of the experimental stage in this line of products. Having all faith that fruit growing could be made a success and profitable here, I had tried to induce some of my horticultural friends to take hold of it and give it a trial. But all seemed skeptical on the question and declined to make the venture. Failing to get anyone

else to take hold, I determined to try it myself. Disposing of my interest in the ditch and turning the management of same over to other hands, I was left free to give my whole time to my farming and horticultural work.

In the spring of 1886 I made my first planting of trees, planting at this time 500 apple, 500 peach, 100 cherry, 100 plum, and a small amount of small fruits of various kinds. Now, in farming and fruit growing I was at home, having had several years' practical experience in both lines of work. But here was a new deal. This farming by irrigation had seemed very simple and easy to my mind up to this time. Theoretically I was posted, and thought I knew something about it. But when I came to putting my theories into practice, I found I had a little more to learn yet before I would be able to graduate as a professional in the art. But my theories and investigations had proven beyond any question of doubt that all the possibilities were here to make a success of this line of work. So I took hold of it with a determination to win, providing my life and health were spared. Since my first planting, in 1886, I have added to my orchard plantings, until I now have about 60 acres planted, comprising 3,000 apple, 300 standard pear, 400 plum, 100 cherry, 200 Russian apricots (budded varieties), and 1,000 peach. Small fruits I have done very little with, further than growing an abundance for home use. Have done the same with vegetables, growing enough for home use only. My specialty has been large fruit growing, the smaller fruits and vegetables being a secondary matter.

Now, on this irrigation question, I find that it is practically divided into three systems: First, by flooding from open ditches; second, pipe line under ground, distributing water by hydrant and hose; third, by tiling, distributing the water below the surface, forming what would be termed subirrigation. The flooding system is the one generally practiced in western Kansas, and the only one with which I have any practical experience. I am satisfied though, for several reasons, that the piping system is much better. I believe the tiling system has advantages over either of the others, provided it can be made to work at all. Of this I am not certain, and am waiting for more information before I adopt either. But I am fully decided that I shall eventually use the piping system if I find the tiling system does not work. This method of irrigation, however, applies to small-fruit and vegetable growing and intensive farming only. For growing grains and hay, the flooding system will always be the most practicable. Under the flooding system, the water is led to each farm from the main canal through what we term lateral ditches, each farmer taking his portion of the water from this lateral ditch through a box or gate which empties into a smaller lateral ditch that is made to convey the water to any part of his farm that he wishes to irrigate. When the water has reached the field or crop to be irrigated, it is then run into what we term a head or supply ditch, and from this smaller ditches are made, which are called field or distributing ditches. These distributing ditches are made at various distances apart, depending on the lay of the land, whether level or uneven. As a rule, however, we aim to make them about 80 feet or five rods apart. I have tried various distances, and I find that 80 feet is close enough, and about as far apart as they will work well in distributing water evenly.

Now, as to the manner of applying water. In all vegetable crops we aim, as far as possible, to run the water between the rows, and not allow it to touch or cover the plants if we can well prevent it. But my main object, when I irrigate, is to wet the ground all evenly and as thoroughly as I can. If it becomes necessary to run the water on plants to accomplish this, I let it run. I find it does the plant little, if any, harm to run water all over it. I used to think that nights and cloudy weather were the best and only safe time to apply the water. But I have found that the best time to apply the water is when the crop needs it and when I can best spare the

time to apply it, whether it be day or night, sunshine or cloudy. I see but little, if any, difference in irrigation at night or in the middle of a hot, sunshiny day.

I find a great many people think that if they have plenty of water to run on their crops they have all that is necessary. This is a mistake. It is just as important, and I think even more so, that special attention be given to the cultivation of the soil or crop as to the irrigation part of it. If I were compelled to make a choice between irrigation and cultivation, would take the latter every time. Am satisfied that I could, as a rule, get better results from cultivation alone than from irrigation alone. In order to get the best results from either or both combined, it is necessary to have the soil in the best possible condition—that is, to have it deeply plowed and every particle finely pulverized before putting in any crop. If the soil is not moist enough at time of planting of crop, it is well to apply the water and give it a thorough soaking. As soon as it dries off sufficiently to go on with a cultivator, give it a thorough stirring, and then go over with harrow or drag, thoroughly pulverizing. This cultivation need not be deep. The point is to get the surface pulverized as fine as possible, which acts as a mulch, checking evaporation and retaining the moisture below. This same condition applies to crop all through the season after each irrigation. Just as soon as ground dries enough to work without sticking, go right on with cultivator or harrow and break the crust that has formed, pulverizing the surface finely.

Observing these rules strictly, I have found that I save a great deal of water, besides trouble and expense of applying so often. Furthermore, thorough cultivation places the soil in condition for the plant to get all the elements from the soil necessary for its growth and lets the air down to the roots. We don't want to lose sight of the important fact that the vegetable kingdom, like the animal kingdom, must eat, breathe and drink in order to live and thrive. I will say here, in this connection, that I have every reason to believe that subsoiling will have a great tendency toward helping retain moisture in the soil. My faith in this was strong enough to induce me to purchase a subsoil plow this last spring and give it a trial. I did not get the time to test it as thoroughly as I should have liked, but I used it far enough to convince me that it will pay well to subsoil every acre I have under cultivation. It does not take as much water by one-quarter or more to attain the same results.

I am often asked the question, "How often do you water your crops?" I might properly answer this question by saying, whenever I think they need it. As to how often we apply the water, depends upon the nature of the crop, character of soil, etc. We simply must exercise our own judgment in this matter. To obtain the best results, we need to keep the soil just at the point of saturation; that is, whenever you can take a handful of the soil, and, by pressing it together, leave an imprint of your hand, you have the soil in best possible condition for plant growth. If there is not moisture enough to make it stick, I know it needs water, and I proceed to give it water. If the cultivation is promptly attended to, you will find you will not need to apply water so often.

As to results of my work thus far, I may say that all of my expectations have been fully realized. Vegetables, such as potatoes (both Irish and sweet), onions, cabbage, turnips, beets, tomatoes, and all garden stuff, produce abundantly. Rhubarb, or pieplant, yields enormously, often producing stalks weighing a pound and over. Have one acre of asparagus, which yielded, the past season, 1,500 pounds of grass, netting me \$110 above all expenses. This was the third year from planting.

In the fruit line, I believe I am safe in saying that the apple, plum, cherry and pear are an assured success, and can be depended upon to give a fair yield any and every season. Many of my apple trees, of such varieties as Missouri Pippin, Wine-sap, Jonathan, and Willow Twig, made a yield the past season of from 8 to 12 bush-

els per tree; cherries made an average yield of one and one-half bushels per tree, and plums nearly three bushels. Peaches, apricots, and other fruits of this class, I find very uncertain, on account of severe cold weather and late frosts which kill the fruit buds. I would not advise the planting of them in a general way. All small fruits, such as raspberries, blackberries, and strawberries, yield enormous crops of fine, large fruit, of excellent quality. The Concord and Niagara are the only varieties of grapes with which I have experimented. Both do exceedingly well, and can be depended upon. As to general farm crops, I have simply aimed to grow a sufficient supply of hay and grain for home use; growing oats, barley and Kaffir corn for grain, and alfalfa for hay. All of these crops give large yields, alfalfa in particular. I commence cutting this crop about the last of May, and it seems almost impossible to stop mowing from that time until freezing weather, the growth being so enormous and rapid. It is a crop peculiarly adapted to irrigation, and its production seems unlimited, where properly irrigated.

Now, there is one more question I wish to speak of before closing, and that is irrigation by windmill and pump. Having what seemed to be an inexhaustible water supply beneath the surface, I made up my mind to investigate and try the experiment of raising this to the surface. In the spring of 1893, I purchased and had put in what is called the Gause pump, using as power to run it a 14-foot Halladay windmill. This pump being put in under the drive-well system, has six 2-inch points, 3 feet long, attached to the same number of pipes of the required length, and all connecting with a larger pipe, having an 8-inch cylinder. The windmill has a 12-inch stroke, and under a fair wind will make about 30 strokes per minute, raising about 70 gallons of water, this being 100,000 gallons every 24 hours. This would be sufficient water to irrigate 20 or more acres of land thoroughly, but we can't depend on the amount from wind power. In fact, I very much doubt whether windmill power is just the power to run these pumps. I know that Kansas has the reputation of being a windy state, but I have found, when it comes to making use of that wind, it is not there. I don't think you can count on a windmill running more than a third of the time, and I doubt if it will run a pump to its full capacity more than a quarter of the time. Such, at least, has been my experience in the pumping business. For this reason I am not hurrying to put in any more windmill pumps. I am now, however, investigating and figuring on putting in a larger pump and running the same by steam or gasoline engine. I am satisfied that pumping water is going to be our chief means of supply in the very near future.

The question is often asked me as to how much land I can irrigate with the pump I now have. This is a difficult question to answer, but I am safe in saying I think that it will furnish an abundance of water for 10 acres, and with a constant and steady power it would, of course, more than double this amount. A good reservoir is needed in order to get satisfactory results. I have a reservoir at this pump, size 100 feet square and five feet deep. In building this I simply used team and scraper, laying off the ground and taking all dirt from inside of reservoir to build the banks. In finishing I plow the bottom or bed of reservoir and pulverize the soil as fine as possible, then turn in the water. I had some difficulty at first in getting it to hold water, but it seems perfectly water-tight now. I have put in fish—the German carp—and they keep the water riled and muddy, which, I think, has had a tendency to seal the bottom and sides. This reservoir, built in this manner, cost me about \$25, and I think it just as good as though I had used cement in making it water-tight, and which, of course, would have added considerable to the cost.

HOW AND WHEN TO IRRIGATE A SMALL TRACT.

By J. W. GREGORY, Garden City, Kas.

Given a tract of 5, 10 or 20 acres, with well, pump, power and reservoir all provided to raise and hold in readiness the water necessary to irrigate the same, the next question is how and when shall the irrigation be applied?

Methods vary somewhat in detail, but the general outlines or principles are the same. The fundamental fact is, that the water must be controlled and directed. No tract of land of any considerable size is so smooth of surface or so disposed that water can be poured upon it carelessly at one side or corner and allowed to run at the whole tract with any certainty of the water spreading evenly over it. Land that is irrigated is apt to develop a great many unexpected inequalities of surface. Even the smoothest appearing piece will show, when the water is turned on, many a bump and sag which the eye did not perceive, but which the water unerringly takes note of, and he who undertakes to irrigate his land without adequate preparation of the surface, and without properly laying off his ground with suitable beds, with borders and lateral ditches, will be vexed to the extreme of his endurance by the persistency with which the water will glide around hitherto unsuspected knolls to make quagmires of multitudes of little lake beds interspersed among them.

If land is clearly and plainly "bumpy," the first thing to be done is to level it by cutting down the bumps and filling up the hollows. This may be tedious work, but the sooner and more thoroughly done the better. Reasonably smooth the ground must be before surface irrigation can be practiced. Sometimes it is economical, on very rough ground, to use common road scrapers or slips. If the ground is in the right condition (say plowed ground that has had a beating rain since the plowing, so that it is mellow yet firm), a piece of railroad iron 15 or 20 feet long does good service as a smoothing tool. But if the ground is freshly plowed and very loose, it will not work. All farmers are, however, familiar with various effectual devices for leveling the ground, and each can find or make something that will answer.

It can hardly be necessary to hint that the pumping apparatus, or at least the reservoir, will be located, of course, on the highest part of the ground to be irrigated, as this is one of those simple, primal necessities which anybody will recognize. It is taken for granted, also, that there has been secured from other sources all needful information about the character and sufficiency of the outlet or outlets from the tank or reservoir, which must be such as to allow a free and copious flow of water enough to supply a "head." If a man is irrigating several acres, he can't fool away his time and waste his water on a two-inch stream.

Having your water supply located in the right place, and your ground as smooth as you can afford time and labor to make it, the next requisite is a head ditch, or distributor, along the high portion of your tract. Into this the water will be allowed to flow from the reservoir, and from it the water will be let out upon all portions of the ground under treatment. Let us imagine our tract to be one of the most usual sort—a square or oblong plat, sloping from west to east, and having the reservoir upon one of the western corners. Then the head ditch will run from the reservoir along the west line of the tract to the other corner. This ditch will vary in size with the area to be watered. It should be ample to carry a free flow of water, but not so large as to occupy too much ground or to unduly waste water by seepage and evaporation. It should be so built that its banks will be high and strong, and its bottom little or no lower than the surface of the ground—or, at least, than the bottom of shallow furrows between rows of growing crop; because, if any deeper, it will waste the extra depth of water every time it is used.

It might be well to say right here that the tyro in ditch building will almost invariably pile up his banks steep and high of soft dirt, and if the work is carefully done, and the ditch straight and carefully made (as it ought always to be), the banks will look pretty at first, but they will not stay that way if he undertakes to fill such a ditch *full* of water right away. One of the sights to make the unskillful laugh and the judicious grieve, is to see a greenhorn trying to run a new ditch brim full of water. At a certain stage the soft banks begin to break; and there are inundations of the roadway, the dooryard, or some other ground that does not need the precious water, while the disgusted irrigator paddles about and vainly shovels mud, and sweats, and peradventure swears. When a ditch is newly made, it is a good plan to fill it half, or something more than half full of water; then shut off the supply and let the banks settle; then fill higher and let settle once more, adding more material if they become too low. Always have the banks of permanent ditches amply high and strong; make the ditches as nearly straight as possible and keep them clear of weeds and rubbish, if you would have a full and satisfactory service of water.

The head ditch is sometimes replaced, in case of small and highly cultivated tracts of valuable land, by a box or flume made of boards, with suitable openings along the sides to let out the water. The head ditch for a small tract should have but little fall away from the reservoir; it is better nearly on a level. If the crop to be irrigated consists of Irish potatoes, sweet potatoes, cabbage, corn, or any other crop which may be preferably grown in rows or ridges, with furrows between, there is nothing further but to plant with the rows or ridges running at right angles to the head ditch, so that the water may be let out at any time into any furrow. If the crop be onions, turnips, or any other crop preferably grown by level culture, then the ground should be formed into beds, ranging from 10 to 20 feet or more in width, for garden stuff, up to 100 feet, or even more, for alfalfa or small grain, according to the character of the surface and abundance of the water supply. A good, copious head of water will run over and wet up rougher ground than can a small stream. □

These beds are made by throwing up borders, with a stirring plow or otherwise, so that, when water is turned in on the beds thus formed between, it will spread and flow evenly along down from the head ditch to the lower end of the bed. Sometimes, when beds are long, it is necessary to make small lateral ditches instead of borders, so that the supply of water may be carried along in them and let out at the sides in the beds, as otherwise the upper end of a long bed would receive too much water and the crop be injured—or at least the water wasted—before the further portions received a supply.

The pleasantest, most thorough and satisfactory surface irrigation is by means of furrows or narrow beds, because the water is thus most nearly under perfect control of the irrigator.

WHEN TO IRRIGATE.

It is an excellent practice to irrigate some ground thoroughly in the winter season, if you have the water, so as to have the help of the frost in mellowing and subduing the soil. It is a good thing to flood new ground that you have just prepared, if you have the water. It will show you where you need to put the finishing touches in the leveling process. Unless the ground is very moist, it is well to irrigate your ground before planting any small seed or grain. The plants come up quickly and get a good start; the seeds sprout evenly and fewer fail to come. Having your crop once well started and kept thoroughly cultivated, further direction may be condensed in the simple admonition: water whenever it is needful. It would take columns of detail to attempt to specify all the minutiae as to time, stages and conditions of growth of different crops with reference to putting on the water. Any husbandman of experience can tell when his crops need rain. Having his reservoir always

full, he simply proceeds to bring on a shower whenever it is needed and just where it is needed.

Some crops may safely be flooded, as alfalfa, the small grains, onions, etc.; but with others, notably Irish potatoes and maize, it is very important that the water be kept well down in the furrows between the rows, and not allowed in any case to rise above the plants.

Most important of all, it should be borne in mind that, important as is irrigation, thorough cultivation is still more important. To soak up the ground time after time, only to let it stand and dry out as hard as a brick, is to waste seed, water, time, and labor. A thorough irrigation tends to compact the soil. Unless, then, the surface is thoroughly stirred at the proper time, the ground, unless it is very sandy, becomes hard, evaporation is rapid, and plant growth is retarded, or even smothered out. It takes prompt work and a good deal of it to till the ground at the right stage after every irrigation, but it pays to do it, and the farmer can't afford not to do it. It will lead to his handling less ground, but he will get enough more off the area tilled to amply compensate for the extra labor. After all, isn't it better to thoroughly fertilize, irrigate and cultivate an acre of ground, and get a whopping big crop off it, than to spread out a great deal more of labor, time and seed on 10 acres, and only get as much of a harvest as off the intensely tilled one acre? This is the question to which irrigation, properly practiced and well understood, is going to compel the truthful answer, and that answer is bigger with portent to the future of Kansas than our people have begun to comprehend.

I have dealt with surface irrigation only. The lucky fellow who has a small tract which he can subirrigate by building a dam, and thus raising the water level, needs no advice or instruction here. He is already advised. To the man who is thinking of tiling his ground so as to subirrigate in that way, let me say: go slow! Make your subirrigation experiments carefully, and get the experience (not the theory) of others along this line. Subirrigation by means of previous tiling doubtless can be made a success, but it is exceedingly risky to depend upon it unless the preparation is made carefully, and exactly upon the right plan. It is costly and full of possible unpleasant surprises. Take surface irrigation for your reliance, and experiment with subirrigation as you can afford it. Subirrigation is one of those glittering, luring, fascinating things which has tempted people, to disappoint them. I have neither time nor space to discuss it fully here.

Now of the scores—hundreds—of useful pointers that might be given to the beginner in the work of irrigation, I have perforce touched upon but a few, and may have omitted a number which could well be considered almost essential.

It occurs to me to add that, if the ground to be irrigated is rolling, the water will necessarily be conveyed in ditches which curve about to suit the necessities of the case, and oftentimes the crops will need to be planted in rows which follow the windings of the surface. If the surface to be irrigated is steeply sloping, the water must be applied along lines which run across the slope—not down it—to prevent washing out ditches and crops, and to retain the water in place long enough to allow it to moisten the soil.

Usually, the water will be let out of the head ditch by cutting a notch in the bank with a spade or shovel. A long-handled, round-pointed shovel is the best tool for the irrigator's use along the ditches. In exceptional places, it will be found convenient to put in permanent boxes, or grates, that may be opened or closed at will. For stopping a "crevasse," when water is leaking out through a soft bank, or in closing a deep cut through which the water is rushing with full force, a wad of strawy manure, hay, weeds, sod, or any fibrous material, jammed into the opening

will be found a needy and valuable aid. In cutting the banks to let out water, if the irrigator will make his openings shallow, obtaining capacity by width rather than depth, he will be able to close them easily when it is desired to shut off the water.

A common stirring plow will make head ditches, laterals and borders cheaply and rapidly; a little dressing and finishing with shovel and hoe being desirable. If there is much ditch to make, it will pay to nail or bolt together, in the shape of a capital A, piece of 2 x 12 lumber, braced firmly apart, and leaving the lower rear corners sloped off. This, drawn point foremost through a newly-made ditch, is a great aid in smoothing and compacting the soil.

THE NATURAL DISTRIBUTION OF ROOTS IN FIELD SOILS.

By PROF. F. H. KING, Wisconsin Experiment Station. From tenth annual station report.

[Illustrated.]

Cultivated plants use large quantities of water in maturing their fruits, and the feeder, whether of animals or of plants, needs to realize that there is no food stuff, either for plants or for animals, more important in its functions than water, for besides being an essential part of the tissues in both types of life, it is the one medium by which all other foods are transported to their destination in the organism.

ROOTS OF INDIAN CORN.

Roots are the water gatherers of plants, and when it is understood that the roots of each average stalk of corn must withdraw from the soil, out of which no amount of pressure can squeeze a drop of water, about 120 pounds, or five full pails, it is not to be wondered at that this great American food plant sends its roots foraging far and wide through the soil in the manner shown by the two engravings, figs. 1 and 2, and then when it is realized that each hill of four large stalks must needs get 20 pailfuls of water out of the soil within reach of its roots, it is plain that only a great mass like that shown in fig. 3, penetrating to a depth of four feet in the soil, is capable of doing such work; and the task seems more wonderful when we remember that the major part of it is done late in the season, when the soil has become comparatively dry.

Studying carefully the roots of the corn as shown in the four photo-engravings, it will be readily seen that they spread steadily outward and downward, and at the stage of coming into tassel every inch of soil in a cornfield, down to a depth of 40 inches, is literally threaded with roots in quest of water, and before the stage of maturity has been reached, these roots have attained a depth exceeding four feet, in well-drained soil.

These engravings of natural water gatherers for the Indian corn enforce their own lesson regarding the depth of cultivation, and of the vast importance of a mulch of loose soil, which shall check all loss of water from the surface of the ground and hold it to be turned to use in maturing the golden grain.

In this study of the distribution of corn roots, an effort was made to preserve all of the roots which occupied a given section of soil as nearly as possible in their relative positions after removal. The method of procuring the samples and of fixing the roots in place was as follows:

With a spade, a trench two feet wide was dug, so as to leave a prism of soil one foot thick, and extending at right angles across two rows of corn, one hill of corn was thus left standing at each end of the prism. The trench was deepened until by inspection it was evident that all roots had been passed. A cage was now made of

galvanized iron and wire netting, just large enough to set down over the prism of soil, and, when this was in place, sharpened wires were forced through the prism of soil in parallel lines along the meshes of the netting, the wires being long enough to reach through and fasten to the netting at each end. The loose soil at the surface of the ground was removed, and replaced by casting in its place a block of plaster of Paris to represent the surface of the ground. At this stage, a force pump, throwing a stream of water about one-sixteenth of an inch in diameter, was used to wash the soil away from the roots, leaving them suspended by the wires, and held very nearly in the true relative positions they had occupied in the soil in which they grew.

In the manner described, samples of corn roots were taken at four different stages of growth, two of which are shown by the engraving, figs. 1 and 2. The first sample was taken July 9, 42 days after planting, when the tops had attained a height of about 18 inches. At this stage the roots of the two hills met and passed each other in the center of rows, 3 feet 6 inches apart, and had penetrated to a depth of about 18 inches. It was found that the surface roots sloped gently downward toward the center of the row, where those nearest to the surface were some eight inches deep. When the corn had attained a height of nearly three feet, at the time of the last cultivation, the sample shown in fig. 1 was taken. Here the roots are seen to occupy the entire soil down to a depth of two feet, which is the height of the cage. At this stage the surface leaders descend in a gentle curve toward the center of the row, where they pass one another and lie only six inches deep.

Just as the corn was coming into full tassel, a third sample was taken, which is represented in fig. 2, and here it will be seen the roots have fully occupied the upper three feet of soil in the entire field. In the center of the row, too, the surface leaders have risen still higher, and a few of them are now scarcely five inches deep, though the great bulk of them are still six inches or more below the surface at the center.

When the corn had reached maturity, one other sample was taken, and in this case a cage four feet deep was required, for the roots reached to and even beyond the bottom. At the center of the row, too, the surface leaders had risen to within four inches of the top of the ground. Nothing can illustrate more forcibly than these samples how deeply and how broadly this great American food plant is able to send its roots foraging through the soil. Not one-half of the actual root surface which occupied the soil is shown in the engravings, because it was chiefly only the leaders or main trunk roots which were preserved in the sample. Each of these trunk roots or leaders sends out from opposite sides, much as the stalk does its leaves, slender rootlets from two to six inches long, and from the surface leaders these slender rootlets stretch directly upward, toward, and nearly reaching, the surface in the latter part of the season.

Now when it is remembered that during the time this wonderful plant is extracting, almost wholly from the passing air, through the instrumentality of the sunshine of summer, from three to four tons of dry matter for every well-tilled acre, its roots are required to pump from the same area from 300 to 400 tons of water, is it strange that there is scarcely a cubic inch of soil in the upper four feet of the field but has one or more rootlets drawing water from it, with the food elements it contains?

CORN ROOTS FROM NINE TO TWENTY-SEVEN DAYS OLD.

In connection with the study of corn roots described above, an effort was made by a different method to procure samples showing the natural position and development of the roots at three earlier stages of growth, 9, 18 and 27 days from planting. Two of these samples are shown by figs. 4 and 5.

The method used here was to have three series of circles, 18, 24 and 30 inches in

diameter, across which was stretched galvanized-wire netting with half-inch meshes. These circles were arranged so they could be strung upon three-quarter-inch iron rods and held two inches apart by means of spools, as shown in the cuts. Holes were dug in the field of the desired size and depth, and in the bottom of each was placed one of the circles of each set. Upon these was then replaced two inches of the soil which had been removed, and well firmed. A second circle was then strung upon the rods and two inches more of soil added. In this manner the soil was replaced so as to have the circles lying in it each two inches apart. The upper circle was covered with about two inches of soil and in this the corn was planted, directly above the center of the upper circle constituting each set.

At the end of nine days the dirt was removed from around the 18-inch cage, and with the force pump, as already described, the soil washed away from the roots. At this stage it was found that some of the roots had extended laterally to a distance of 16 inches, and that some had reached a depth of eight inches. No roots were found above the upper circle at a distance of three inches from the hill, and none above the second circle at a distance of nine inches. The tips of the longest roots were six inches below the surface, and no roots were nearer the surface than three inches, at six inches from the hill of corn.

Nine days later, that is, 18 days from planting, the second cage was washed out, and is represented in fig. 5. Here all roots had sunk below the top circle at a distance of 5 inches, and below the second circle at a distance of 18 inches. The tips of the longest roots had spread laterally to a distance of 18 inches, and were five or more inches below the surface. The longest roots extending downward had scarcely reached 12 inches. No roots were nearer the surface than 2 inches at 6 inches from the hill.

The roots of the remaining sample were washed out 27 days after planting, and are shown in fig. 6. Here all roots were below the upper circle at a distance of 3 inches from the center, and below the second circle at a distance of 16 inches. The greatest depth to which the roots had reached was 18 inches, and the longest roots extending sideways had reached 24 inches from the hill, and their tips lay 4 inches below the surface. At 6 inches from the hill, no roots were nearer the surface than 2 inches.

THE VERTICAL DISTRIBUTION OF ROOTS.

To procure samples illustrating the vertical distribution of roots in field soils, the following method was used:

A galvanized-iron cylinder, 12 inches in diameter and four feet long, was provided, with a stiff, outside collar at its upper end to enable it to retain its form while being driven, and an inside collar at the lower end, so as to cut a core of soil a little smaller than the cylinder. The sides of this cylinder were perforated with series of $1\frac{1}{4}$ -inch holes, through which water could be forced with the pump, to wash out the soil from the roots. In obtaining the sample, the cylinder was driven down vertically into the soil with a sledge, by striking upon a heavy block of wood placed upon the top of the cylinder. After being forced into the ground in this manner to a depth of six to eight inches, dirt was removed from around the cylinder to within an inch of its lower end, when it was forced down again; this was repeated until the cylinder was forced its full length into the ground, when it was lifted out, carrying all of the soil and roots with it. Two grain sacks were now drawn over the cylinder from opposite ends and the whole immersed in the lake and left from 12 to 24 hours for the soil to soften, thus enabling it to wash out more readily under the jet from the force pump.

In this manner, samples were taken of blue grass, timothy, clover, winter wheat, barley, oats, and the English forage plant, *Lathyrus sylvestris*, and engravings of

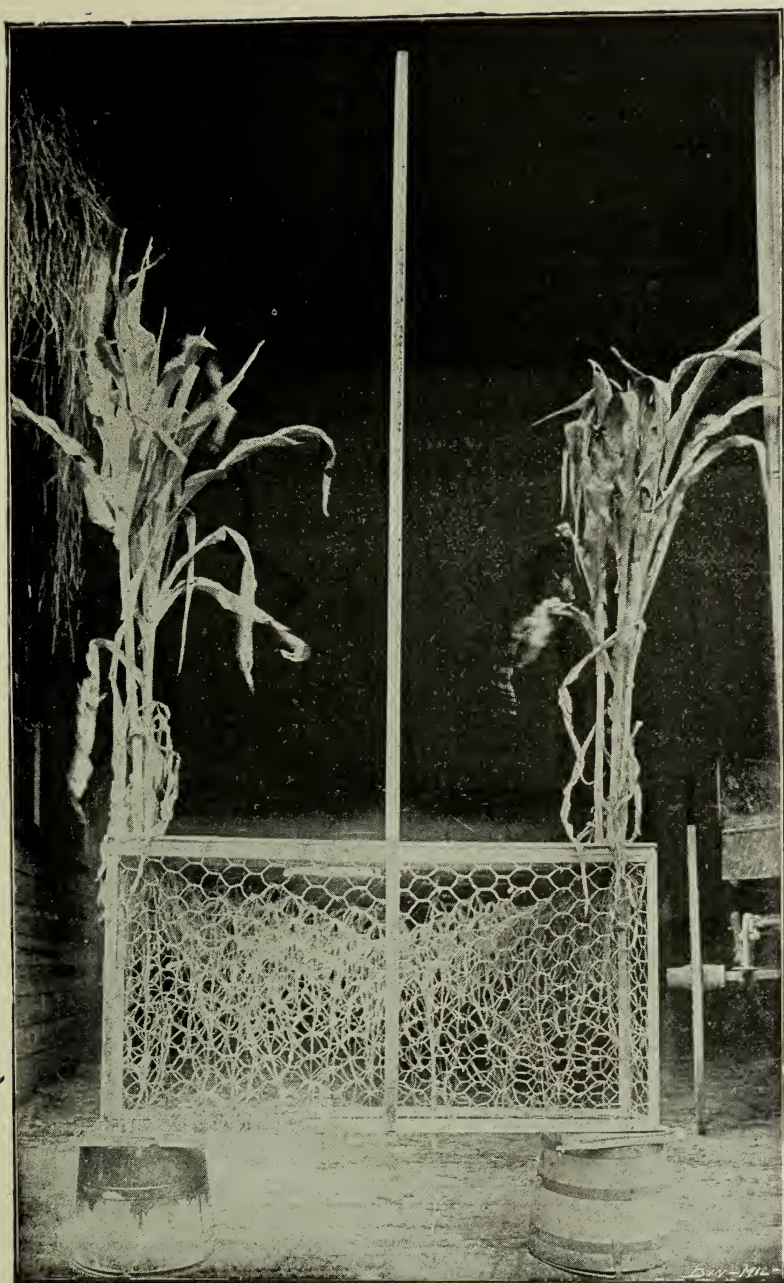


FIG. 1. Showing the actual distribution of corn roots between rows at the last cultivation.

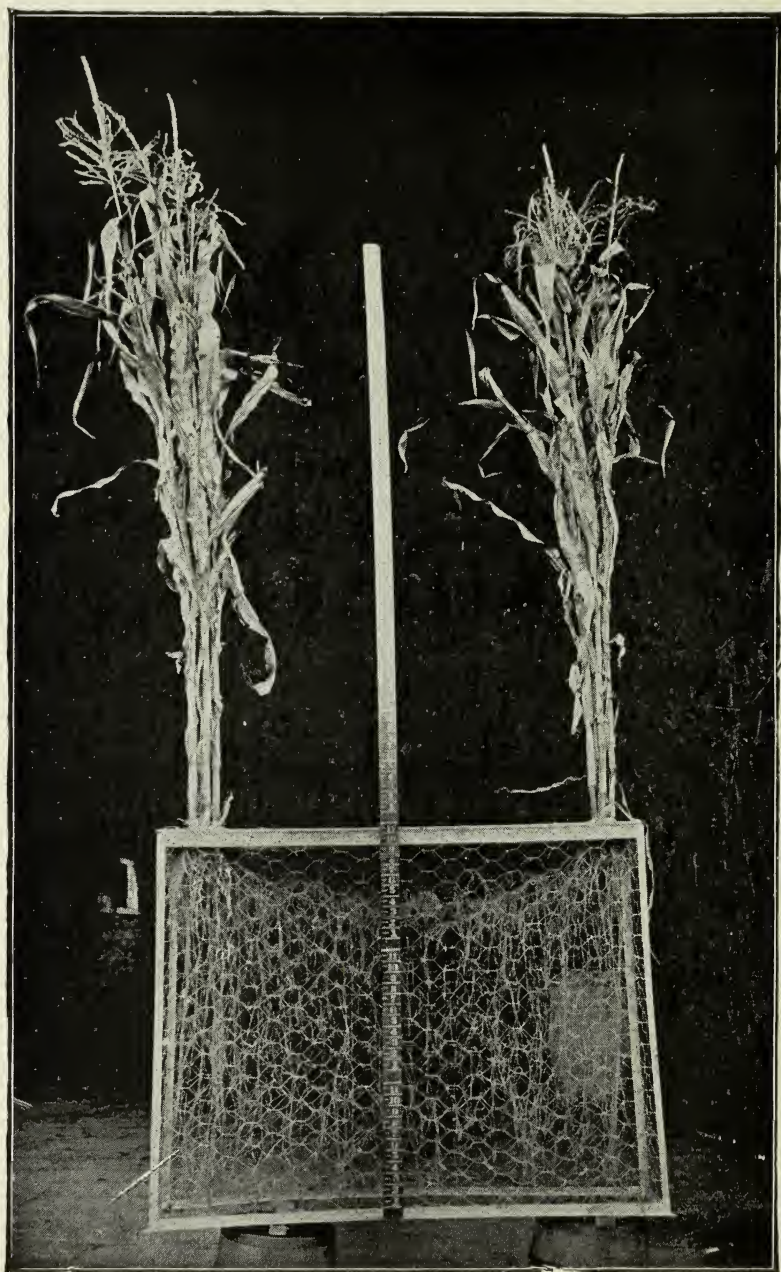


Fig. 2. Showing distribution of corn roots between two rows just as it is coming into tassel.



FIG. 3. Showing the total root of four stalks of corn.



FIG. 4. Showing the manner in which the corn roots of fig. 3 were grown.

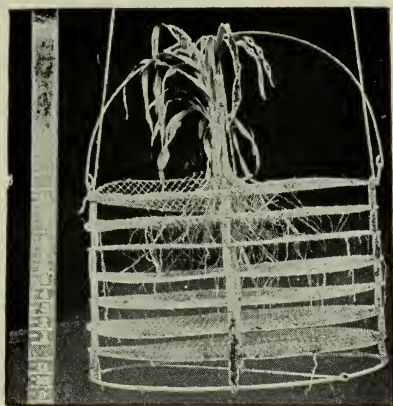


FIG. 5. Showing the development of corn roots 18 days after planting.

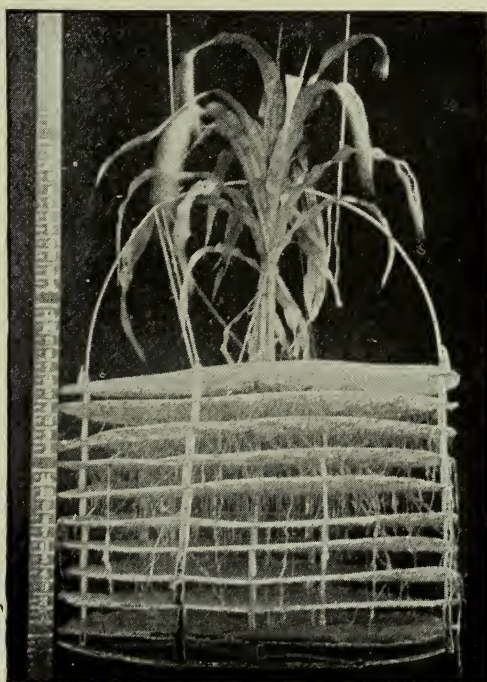


FIG. 6. Showing the development of corn roots 27 days after planting.



1. Wheat.

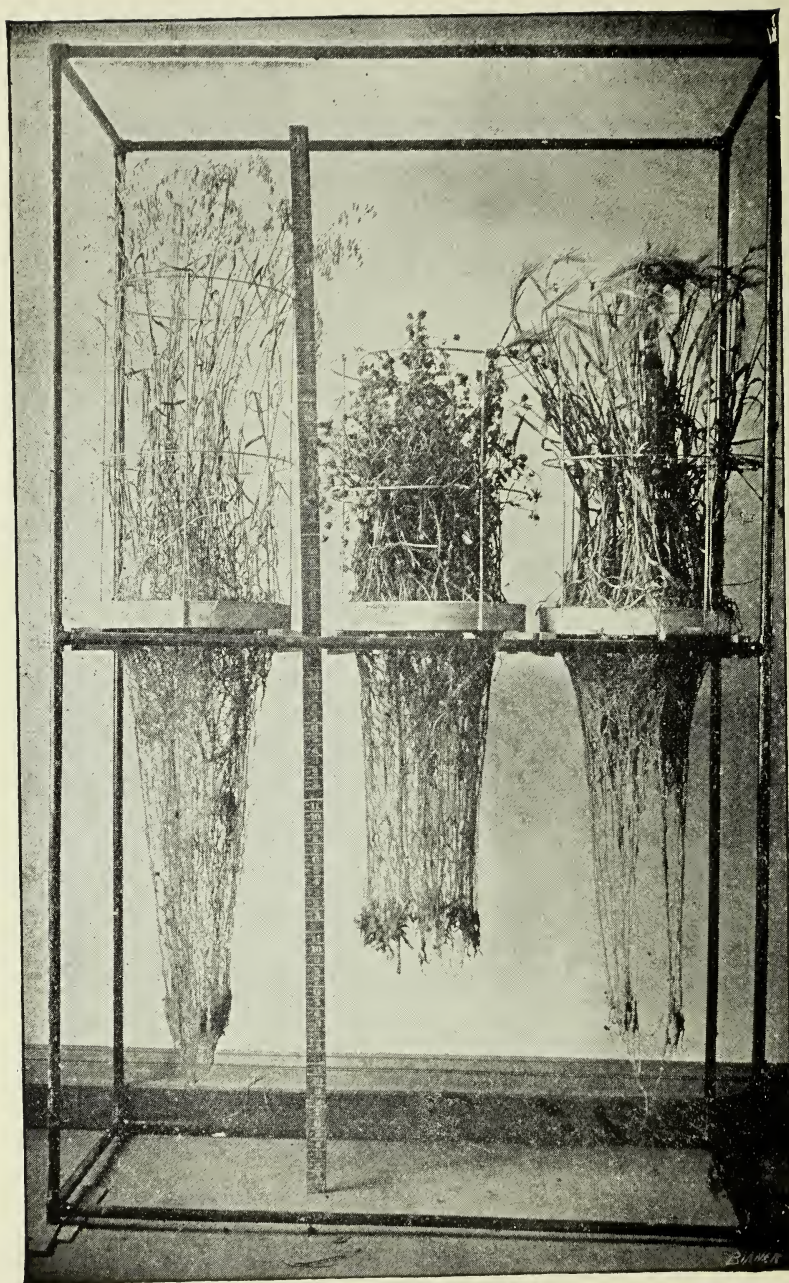
2. Barley.

3. Oats.

FIG. 7. Showing the vertical distribution of roots under natural field conditions.



1. Blue grass. 2. Timothy. 3. *Lathyrus sylvestris*. 4. Clover.
FIG. 8. Showing the vertical distribution of roots under natural field conditions,



Oats.

Clover.

Barley.

FIG. 9. Showing the total root development of oats, clover, and barley.

these are shown in figs. 7 and 8. It should be noted that, with this method of procuring the roots, only those extending directly down from the tops were secured; those which may have extended laterally from these tops were of course cut off by the cylinder, and any which may have come into the cylinder from plants outside would largely fall out with the soil in washing. Only the roots, therefore, which grew vertically downward within a circle whose diameter is one foot are all that were obtained, and all that are shown in the cuts.

The clover, blue grass, oats and barley grew in clay loam some eight inches deep, underlaid by a rather stiff clay subsoil 2.5 feet thick, which in turn rested upon a rather coarse, yellow sand, and the land was tile drained at a depth of four feet. The timothy, winter wheat and *Lathyrus sylvestris* grew upon higher ground, in rather heavier soil, underlaid with a firm, reddish-clay subsoil, containing some gravel. It will be observed that the blue grass has much the shortest roots, being only about 26 inches long, while in each of the other cases a length of nearly or quite four feet is attained. The coarse sticks seen entangled among the roots of the winter wheat are live roots of the black oak, which came from a tree standing 34 feet away, in a pasture adjoining the wheat field, and serve to show how far, how deeply and in what a net work the roots of this tree permeate the soil.

In these samples, except the blue grass and timothy, the larger part of the side branches or fine rootlets have broken away, leaving only the main trunk lines, and these have been drawn and matted together by the water so as to form an unnaturally slender mass. In the soil they extended vertically downward and filled the whole circle shown by the tops, but it was found impracticable to keep them separate and true to life in this particular.

THE TOTAL ROOT DEVELOPMENT OF OATS, BARLEY, AND CLOVER.

An effort was also made to determine the amount of dry matter stored up in the root, and also to preserve specimens showing the total root development which was associated with a given amount of top. To determine the amount of dry matter stored in the root as compared with the top, and to procure specimens showing the amount of root which produced a given amount of top, the soil was very carefully washed away from the roots of the several crops which have been grown in cylinders. Fig. 7 shows the roots of barley, oats and clover thus obtained, together with the tops which grew upon them. The cylinder in which the clover was grown was 30 inches deep, and about 10 inches shorter than that in which the oats and barley were grown; this explains the difference in length shown.

Fig. 4 of oats, barley and red clover corresponds to fig. 3 of the Indian corn. In each of these cases the ratio of dry matter in the root to that in the top stood as given in the following table, where short stubble in each case are included with the root.

TABLE showing ratios of dry matter in roots and tops.

	CORN.		OATS.		BARLEY.		CLOVER.	
	Top.	Root.	Top.	Root.	Top.	Root.	Top.	Root.
Pounds.....	460.5	68.5	150.7	67.3	57.6	17.07	59.77	15.49
Ratios.....	6.723 to 1		2.239 to 1		3.374 to 1		3.859 to 1	

From these ratios the approximate amount of dry matter left in the soil by these crops can be computed from the average yields of dry matter above ground per acre. Calculated in this way, the yields of dry matter in the soil left by the roots would be as follows.

TABLE of dry matter left in the soil by the roots.

	DENT CORN.		BARLEY.		OATS.		CLOVER.	
	Top.	Root.	Top.	Root.	Top.	Root.	Top.	Root.
Pounds.....	7,598	1,130	4,157	1,232	6,083	2,717	4,000	1,037
Ratios.....	6.723 to 1		3.374 to 1		2.239 to 1		3.859 to 1	

Under natural field conditions, barley, oats and winter wheat send their roots fully four feet below the surface in quest of moisture. Clover and timothy send their roots equally deep, but not deeper, and the influence of clover roots upon the soil must be sought in other directions than in the quantity of root or in the depth to which they penetrate the soil, for in both of these particulars they are equaled or even surpassed by other crops. Blue grass is eminently a surface feeder, whose roots so fully occupy the soil that there is no room for the roots of other plants to associate with them. And it is because of the shallow depth of the roots that this grass grows so little during the dry part of the summer.

HOW TO BUILD A RESERVOIR.

By I. L. DIESEM, Garden City, Kas.

To build a reservoir for irrigation purposes, first lay off the ground, designating the location of the embankments. The best size for a windmill plant is 100 feet square. Build the reservoir on the highest ground, and if this should be on sod, it should be plowed up and removed; if the sod is left and the embankments are built on it, it will create a seam for the water to seep through. If there is sod on the inside it should be removed. It should not be used for constructing the banks, but may be used after the banks are completed for sodding them on the inside. Plow up the inside, and with a common slip scraper move the soil onto the banks, making them five feet high above the level of the ground outside. It will only take about 8 or 10 inches of the earth from the inside to make the banks. Make banks 12 feet wide at the bottom or base of the slope, and slope upwards, drawing in from both sides until the bank is left about three feet wide at the top, which leaves a convenient walk. The slope may be left nearer perpendicular on the outside than on the inside, as there are no waves on the outside to wash the banks, while on the inside they should be as sloping as possible, and the more so the less the waves will wash them. The inside of these banks may now be lined up with slough grass or any tough sod which will be a protection from washing or cutting away. It can be done cheaply, and will make the banks look neat and clean. Labor is all it costs to do this; it will also assist in preventing the seepage of water through the banks. Brush laid loosely along the banks and weighted or staked down helps to break the waves. But where stone can be had to riprap the inside it will pay to do it, and is better than any other plan yet known to preserve the bank, and makes necessary less repairs to keep it up afterward. I used stone on one end of one of my reservoirs two years ago, and have had no repairing to do on that part since.

It will take two men and one team 8 or 10 days with plow and scraper to build one of these reservoirs. When the banks are completed then stir the bottom of reservoir three or four inches deep and harrow it as fine as for a garden, then commence to pump water, and, as soon as the bottom is covered, tramp with horses or cattle until the entire bottom is covered with a sloppy mud; this will then settle

into and close the pores of the soil, and the loss by seepage will be comparatively small. Do not stop pumping now, but keep it going and fill up the reservoir as fast as possible. Taking the soil from the inside to build the banks spoils no soil on the immediate outside, where the garden and orchard should be; also the closer the supply of water to the ground to be irrigated, the better work can be done and the greater the area that can be covered with a given quantity of water.

Any man who has a reservoir should have it stocked with fish, and if there is 8 or 10 inches of water in the bottom that he cannot draw out his fish are always secure.

Any kind of grass can be sown and grown on the outside of bank to suit the owner's pleasure. The box for outlet can be made from 2x10 or 2x12 plank. Cut off the inside end at an angle of 45 degrees; put the long end down, and put a two-inch plank on this end, fastened at back on top with hinges, having under side of plank lined with rubber or leather, as a pump valve, and, when this is closed, it should not leak, as the weight of water will keep it closed; if not, then add a weight; this can be opened by a rod or wire and put back at pleasure from the top of bank. Where parties can procure gypsum in their locality, it would greatly help to cement the bottom of reservoir if put in before tramping is done—say two inches deep.

OBSERVATIONS ON SUBSOILING.

A SIX YEARS' EXPERIENCE.

By SCOTT KELSEY, Topeka.

My farm adjoins Oakland on the east, about three miles from the center of Topeka, and contains 187 acres, all in the Kaw valley. I first occupied it 15 years ago, and found it produced about 30 bushels of corn per acre, and other crops in the same proportion. I believed the soil on this farm could do better, if given a chance, and at once commenced plowing deep, my previous experience in Indiana having satisfied me of its importance and value. I have tried to improve on my methods of cultivation every year since, and, as a result, have averaged over 60 bushels of corn per acre for the 15 years, and have never had a variation of over 20 bushels per acre between the best and the poorest crops, except in 1894. It was my privilege to introduce the first lister into this part of Kansas, in April, 1881, and for several years I was almost the only farmer in the county planting and cultivating corn one way only. I found that listing corn suited the soil on my farm better than check-rowing and have continued it ever since.

Notwithstanding the increase in corn and wheat yields, I was still of the opinion I needed to go deeper into the soil than I had yet been able to do. I went to Kansas City in the spring of 1888 and, after much difficulty, found probably the only subsoil plow in the city, and bought it at reduced price because the dealer wanted to get rid of it. I subsoiled 20 acres by following the surface plow during the spring of 1888. The results were a crop of corn enough better in quantity and quality to encourage me to go on. I did not measure and weigh the corn on the subsoiled land to determine the exact difference, but always considered that the increase was at least 20 per cent., and the corn ears were always better filled out and heavier where the land was subsoiled. I am well satisfied that I get much better results from manure plowed in surface soil when a subsoiler follows than where manure is applied to land that has never been subsoiled.

In fall plowing, I noticed a dryness in the subsoil of the land that had been longest in cultivation, but when I came to land that had only been in cultivation a few years, I found a marked change, the subsoil being more mellow and moist, which led me to infer that land, no matter how uniform the texture after sod is first subdued, will, with continued cultivation at uniform depth, become compacted or hardened immediately below the surface cultivation. When subsoiled, the dryness of the under soil disappears, and the whole seems to be uniformly mellow and moist as deep as plowed. In husking corn, we could always tell to a row when we came to subsoiled land.

During 1893 and 1894, I have given more attention to the quantity of corn gathered from subsoiled land. One piece of land containing 30 acres, plowed and subsoiled to a depth of 20 inches in the fall of 1890, and again in the spring of 1893, gave a yield of 85 bushels per acre for the season of 1893, and the same piece of land, without subsoiling, reproduced 65 bushels per acre for the season of 1894. The extreme dryness of 1894 did not seem to seriously affect it. Another tract of 25 acres that was subsoiled in the fall of 1888, and has not been subsoiled since, is of the same quality as that subsoiled, and having equally as good cultivation and care

during the season of 1894, gave a yield of only 35 bushels per acre, and the corn was of inferior quality, and chaffy. When the dry weather set in, this corn began to fire at the bottom, and evidently was suffering from lack of moisture, while the corn on land thoroughly subsoiled in 1890 and 1893 maintained a good color until maturity. It did not seem to be affected by the dry weather; matured fully, and made good, sound corn.

In the spring of 1894, I planted 28 acres in early potatoes, about one-half being on land subsoiled in the fall of 1892 and again in the fall of 1893; the other half had never been subsoiled. The potatoes averaged 100 bushels per acre, and I did not notice much difference in the yield on the land subsoiled or that not subsoiled. Evidently, crops maturing before the hot weather sets in do about as well on surface plowing as on subsoiled ground. A portion of this 28 acres of early potatoes was sown to millet after the potato crop had been "laid by", all at the same time, in the same way, with the same seed, and came up alike; but during the July heat the millet on the surface-plowed land all died, and I did not harvest a pound from it. That on the subsoiled land did not seem in the least affected by the dry weather, and I gathered from it a yield $1\frac{1}{2}$ tons per acre.

It is during July and August that the value of subsoiling is made manifest.

Part of my land was planted to trees, by nurserymen. The trees were always lifted with a tree digger, that runs 20 inches in the ground. Corn planted on such ground always gave larger returns the first two seasons after the tree digger had been used. My neighbor, Mr. Taylor, just across the road on the south, planted corn, in 1894, on land where the tree digger had been used the previous autumn. The corn "suckered" badly, and averaged five stalks to the hill, and yet Mr. Taylor informs me that it yielded 50 bushels per acre, and if the stand had been thinned 50 per cent. the yield would have been at least 20 bushels per acre greater.

I am well satisfied from my six years' experience here that subsoiling is profitable on my farm, and in the Kaw valley. I also find that the good effects of subsoiling last about three years. I have, therefore, decided to subsoil, if possible, one-third of my farm each season. I run the surface plow eight inches deep, and follow with the subsoiler, loosening it 8 to 12 inches deeper. This puts it in condition to readily receive all the water that falls during a heavy shower, and the surplus readily finds its way into the soil below the plowing, to be stored there for use of the growing crops in the dry weather and while the grain is maturing.

I prefer subsoiling in the fall and early winter, as I have more time then. I get more out of the winter rains and snows, and I believe the soil is in better condition for spring planting. Where subsoiling is done in the spring, it needs good rains following to produce best results for that season.

I am a strong believer in subsoiling, in deep plowing, in thorough cultivation, and in keeping the soil pulverized to the greatest depth possible, having found by experience that it pays.

In 10 years, the wheat crop on my farm has averaged 24 bushels per acre, including one season of complete loss by freezing. The corn crop has averaged over 60 bushels per acre on all my subsoiled land, since I began subsoiling. Having introduced potatoes as one of my crops, I have just marketed the crop of 1894 from 28 acres, for which I realized \$1,495.71, besides 20 tons of millet grown on the same land, worth \$100, making returns of \$1,595.71 from this 28 acres, for an extraordinarily unfavorable year.

During the past year there have been frequent allusions in the public press to observations made upon deeply stirred or subsoiled land by Messrs. Youngers & Co., nurserymen, at Geneva, Fillmore county, Nebraska, and the fragmentary statements

made have attracted wide attention. In order to obtain the exact facts, this Board addressed inquiries to Messrs. Youngers, and Mr. Peter Youngers, jr., a member of the firm, has kindly furnished the following, which includes observations to the close of 1894:

"Several years ago our nursery firm observed that, whenever we planted grain, corn or potatoes following a crop of trees, we invariably had much better results than where ordinary plowing and cultivation had been followed. This led us to experiment on field as well as nursery crops, and we find that the same deep plowing and thorough preparation of the soil for field crops will pay as well as for any other high-priced crop. The main expense is in the subsoiling. This, in fact, is only an extra plowing. We prepare the soil by first plowing eight inches deep with an ordinary stirring plow, which is followed by the subsoil plow, stirring the soil eight inches below this. The subsoil plow does not throw the soil to the surface, but merely loosens it in the bottom of the furrow. We use three horses on each plow.

"By this method of plowing we have a bed of 16 inches of mellow soil ready to act as a reservoir to hold any surplus moisture that falls during the season. About August 15, 1894, when the earth was so dry on the ordinary plowed land, the subsoiled land retained moisture enough to ball in the hand under slight pressure, and three weeks after the hot winds had destroyed the surrounding cornfields, the field that was subsoiled stood uninjured—scarcely any of the tassels killed. This field was planted entirely too thick to obtain good results. Wherever a hill was not crowded the stalks had well-developed and well-matured ears, though the continued dry weather caused a failure of the corn crop on account of thick planting, some hills having as many as seven stalks. This thick planting was caused by an error in not changing the plates in the planter after being used to drill corn for fodder.

"But the results in other crops fully satisfy us that subsoiling is no longer an experiment. For instance, rye land subsoiled yielded $30\frac{1}{2}$ bushels per acre; land not subsoiled, $2\frac{1}{2}$ bushels. One field of 20 acres was planted to oats. Part of this had raised two crops of corn since subsoiling, the oats being the third crop, and the yield was $39\frac{1}{2}$ bushels per acre. Another portion of the field had raised but one crop of corn since subsoiling, the oats being the second crop, and the yield was $44\frac{1}{2}$ bushels per acre, while oats in an adjoining field, not subsoiled, yielded 17 bushels per acre. Potatoes planted in May yielded 96 bushels per acre of good, average size.

"Last year, 1893, on subsoiled land, a yield of 75 bushels of corn per acre was obtained; on land not subsoiled the yield was 36 bushels per acre.

"The land on which the experiments were conducted is high prairie, our well being 114 feet deep."

Mr. C. W. Peckham, of Haven, Reno county, Kansas, contributes from his observations and experiences in 1894 this statement:

"I bought a subsoil plow a little more than a year ago, and during last winter and spring I subsoiled about 50 acres. The work was done with two teams and two plows, in the following manner: The first plow was an ordinary 16-inch sulky plow, drawn by three horses, and run seven inches deep. I was careful to plow all the ground. The second plow was the subsoiler, drawn by four good horses, combined weight 5,800 pounds. The subsoiler was run in every furrow, at a depth of 8 to 10 inches below bottom of the furrow made by the sulky plow. One horse on the subsoiler had to walk on the plowed ground. The subsoiler pulls very hard, even for four horses. In a field 120 rods long, we generally stopped at both ends, to allow the team on subsoiler a little rest. The man who held the subsoiler had no picnic at all. After the ground was plowed and subsoiled, it resembled an ordinary plowed field, the surface soil being on top. When we harrowed the ground, it seemed as if

the bottom had dropped out—the horses sank nearly to their knees. The ground being level and very loose, I could not plant it with a lister, so used a common two-horse check-row planter.

"Last year was the dryest in 23 years. My corn on subsoiled ground made 35 bushels per acre. Corn planted the same way on just as good ground, only not subsoiled, made very little or nothing. I subsoiled my potato ground. From nine bushels of seed I raised 110 bushels of potatoes of a superior quality. I subsoiled my garden, and never had a better one.

"I have just begun to realize the full advantage to be derived from subsoiling. Wherever I have used the subsoiler for the first time I have found the subsoil very dry and very hard. During the first half of December I prepared a field for alfalfa, subsoiled and planted to corn last year. I plowed and subsoiled it again this year. I ran the first plow 8 to 10 inches deep, the subsoiler 10 to 12 inches below bottom of furrow made by the first plow. The dry, hard subsoil I encountered last year has vanished. Surely the moisture from below has met the moisture from above. I verily believe that, when our land is subsoiled, the subsoil that is now dry will then remain moist, and crop failures will be rare. Will this not be cheaper than irrigation? I shall subsoil all my ground as soon as possible. My subsoil plow cost me \$12.46. I would not exchange it for its weight in silver if I could not get another that would do the same kind of work."

In answer to a query as to why it is that a subsoil plow does not invert the soil or throw it up in furrows, Mr. C. J. Norton, of Morantown, Allen county, Kansas, furnishes the following suggestive illustration to the *Kansas Farmer*:

"It is absolutely impossible for the plow to turn out any soil at all. Let us imagine that we have a pit dug in the ground about a shoulder high, and that the surface was composed of a little soil, underlaid with water-tight and air-tight coal that had not been disturbed for ages past. Now, we take a wedge and insert it in the hard coal, about 24 inches from the surface, and sledge away at it. Do we expect the wedge to cut a hole like a wad cutter, or turn up a groove like a carpenter's grooving plane? Of course not. We know that continued hammering on the wedge will cause a seam to open up in the coal parallel to the length of the wedge. This seam will grow larger and larger until the coal opens up a crack just above the wedge and running up to the surface. We all understand why this is and expect it to do so. Now, suppose our wedge was made so that we could screw on an additional handle and continue to force the wedge in, and that, in order to help us, we have attached to the wedge an upright standard that extends out of the ground far enough to allow us to hitch on a team to help us. We continue to sledge, and the wedge travels farther and farther into the coal, and the seam continues to open up in front of the wedge and the crack up to the surface continues ahead of the wedge.

"How is it possible for the wedge to throw out any soil? The point of the wedge will have enormous friction, but the standard meets with no resistance and cannot possibly throw out any soil. Now put a man on the surface to drive the team, and he walks on the open crack. Will he not rattle down some surface soil, instead of bringing any up? As the seam and crack will receive more or less of this soil, are they ever going to get back where they were? If we drive another wedge two feet away, and another between these two, will we not break up and destroy the solidity of the whole surface above the wedges? Wouldn't the coal, that was previously air-tight and water-tight, now be thoroughly pulverized, and contain a large amount of water as soon as it rained? If the surface sloped towards the pit, would not the pit be found to be a spring constantly fed by water that formerly had run off into the

creeks? As soon as we subsoil our lands, or springs will fail to go dry, creeks will fill, timber will start up, and all nature will be changed; the surplus water that ran off and caused our floods will now sink into the soil and subirrigate our crops."

A leading agricultural journal well says: "Whatever adds to the producing power of the soil must be regarded as a fertilizer, and the first of all fertilizers is moisture. There is no soil so poor but which is still fertile enough to yield a fair crop if water can be applied in a regular and uniform quantity sufficient for the plants. But water cannot be so applied to most soils, and in proportion as the decayed vegetable matter in the soil is destroyed by tillage the ability of the soil to hold what moisture it receives is destroyed. The loss of fertility and loss of moisture are, therefore, coöperative to a large extent, and the problem of increasing fertility is solved by increasing the moisture in the soil.

"The mass of moisture reaches the soil as rainfall. It escapes in three ways: (1) By running off the surface; (2) by leaching through the soil; (3) by evaporation into the atmosphere. The rapidity with which the waste goes on depends on the physical condition of the soil, and it is here that the ability of the farmer to control moisture finds full scope.

"The capacity of a soil to absorb and retain moisture depends on the relation of the particles in that soil to each other, as well as on the size of the particles. A clay soil may be in a fair condition for tillage and producing good crops till at some time when the soil is full of water it is tramped by animals or stirred by the plow. The result is, the soil runs together in mortar; when it dries out it bakes, and is lifeless and unproductive. The size of the particles of earth has not been changed. They have merely been brought into different relations to each other. Other causes producing changes of relation in the particles of soils of different character give results equally as striking and important as the familiar illustration given above. It is a common experiment to fill a filter with clear river sand, and on this sand weak manure water is poured. At first, the water will run through the sand and will be filtered nearly or quite clear. But after a few minutes the flow of water will cease, and the pure sand will then hold water as if it were a clay. The action of the manure water has served to change the relation of the grains of sand till they make a tenacious soil.

"The farmer can conduct these experiments on a scale as extensive as his farming operations, and always with the same results. Manure or other material abounding in organic matter applied to a porous soil will make it more tenacious, and therefore more retentive of moisture; while drainage and subsoil plowing will aerate and increase the absorbing power of heavy soil, with similar beneficial results."

The object of subsoiling is to so prepare the soil that it will take and retain moisture to such a depth as to enable it to meet all demands made on it by the crops being raised. With the ground hard and little time given for the soaking of the water, a heavy rain does little good, for the greater portion of the rainfall runs off on the surface, all for lack of a proper receptacle in the subsoil, where it may be held for future use. It is wonderful how much more moisture may be found in an acre of subsoiled ground in a dry season than in an acre not so treated. It is claimed by Professor Sanborn that an acre of ground subsoiled had in a dry September, to a depth of 15 inches, 110,625 pounds more water than an adjoining acre not subsoiled. There is no question but that this would carry a standing crop through a dry period severe enough to kill off the crop on the adjoining acre. Subsoiling has also been proved

to enable the fertilizers applied to a field to do far more satisfactory work than is possible on a field not subsoiled.

"Plants will starve in any soil, however fertile, unless water is present to dissolve the food elements and prepare them for the plants' use. The soils that are most thoroughly pulverized and divided into fine particles so that a better mechanical arrangement of the soil grains (resting lightly and uniformly one against the other) is secured, are capable, as a rule, of holding the highest percentage of moisture. This moisture, in turn, draws from the soil the highest percentage of food, and a soil in this condition obtains much more value from a given quantity of fertilizer than a soil of coarser or more uneven texture, and a consequent lessened capacity to retain water. Manures usually increase the moisture-content of a soil, by improving the mechanical arrangement of the soil grains, and in this way become a means to make its own food elements better available to the plant, besides unlocking fertility in the soil itself not before available to the plant because of insufficient moisture to dissolve it."—*H. R. Hilton, Topeka.*

"Our ordinary prairie and bluff soil, as plowed year after year to a depth of four or five inches, becomes impacted just below the shallow, mellow surface by the treading of the horses in the furrow and the pressure of the plow in rolling the furrows until it becomes almost as impervious as hardpan," writes Prof. J. L. Budd, of the Iowa agricultural college. "Subsoiling to a depth of from 12 to 15 inches gives a deep seed bed, that holds moisture even during such a trying season as the past one. During the past 25 years we have practiced a method of subsoiling in garden, potato field and nursery which has given remarkable results with little increased cost. We subsoil deeply under the rows only, just prior to planting. With this plan, the summer rains run under the rows, and, if the fall is considerable, it percolates from the softened trenches under the intervening spaces and softens the whole surface. As an instance, in planting potatoes in garden or field, we mark out the rows with the subsoil lifter, running it under each row to a depth of from 12 to 15 inches. On this deep, mellow seed bed the seed is dropped, and pressed down by stepping on the pieces. The pressure of the foot sinks the seed down in the mellow furrow four or five inches, permitting perfect covering with a harrow. Over these trenches we have grown 300 bushels per acre, when on untrenched soil the yield was less than 100 bushels. But the gain is not so apparent in very wet seasons. In the nursery, we run the subsoil lifter under every row. The rows for setting grafts of cherry, plum and pear we mellow up to a depth of 15 inches by running two or three times in each row. During the past dry summer, all visitors have been surprised at the growthy expression and perfect health of our nursery trees standing over these deeply mellowed trenches."

Professor Burrill, of the University of Illinois, says that the water requirements of a tree in full leaf in warm weather are astonishingly great. "A good-sized apple tree, having 25,000 feet of evaporating surface, which is by no means a large estimate, will give off 31,200 ounces per day, or substantially 250 gallons." Of course, before this water can be given off from the leaves, it must be absorbed from the soil by the roots. This gives something of an idea of the enormous amount of water that we have in our soil. It has been demonstrated that 100 pounds of sand will absorb 25 pounds of water; 100 pounds of loam, 40 pounds; 100 pounds of clay loam, 50 pounds; 100 pounds of clay, 70 pounds. This explains why some soils always appear drier than others, and why, after an irrigation or a shower, some soils become like a thick paste, while others are only comparatively damp.

SOME SUBSOILING MAXIMS.

Subsoiling and deep plowing mean deep storage of the rainfall, and less risk of waste by surface evaporation. They also mean more rapid drainage, and getting into the cornfields for work more promptly after heavy showers to stop the waste.

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Soil in its natural state is more apt to crack and fissure, and dries out much sooner than soil that has been stirred with an implement. Stirring the soil gives it a more uniform texture, and makes it more receptive and retentive of moisture. Thorough cultivation enables the soil to hold more water and feed more roots.

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The finely pulverized soil attracts and holds the highest percentage of moisture. The roots of plants seek the moist places, therefore, to secure deep rooting, the soil must first be made fine and then turned under by deep plowing. To secure shallow rooting the fine soil should be retained near the surface.

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Heavy rains cause the soil grains to settle more closely together in the most favorable position to pull water to the surface by capillarity. In this condition the soil is an effective pump—drawing the moisture from below to the surface, where it is readily evaporated.

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Cultivation of the soil promptly after each compacting shower forces the soil grains further apart, admits the air freely to the depth cultivated, dries out the surface soil, and then destroys its power to pull water from below by surface tension. This puts a blanket of dry soil two or three inches thick between the moisture in the soil and the evaporating sun and winds, thus conserving it for evaporation through the plant itself, which is profitable, instead of at the surface of the ground, which is waste.

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Commence this year saving moisture for next year's crop. Stop all leaks promptly, whether a crop is growing on the field or not. If it pays the irrigator to soak his land in winter in preparation for spring crops, it will certainly pay the farmer depending on natural rainfall to save all that falls during fall and winter. Keep the soil at all times in the condition most favorable to store water and least favorable to waste it.

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As far as possible do all the subsoiling or deep plowing for any crop the season before, and cultivate shallow just before planting and while the crop is growing. As a rule, tenacious or sticky soils can be subsoiled or cultivated deep at any time, but with porous or light soils, deep spring cultivation needs to be followed by heavy rains to secure good results that season.

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Don't plant any more acres in corn than you have teams with which to stir and loosen the soil promptly after each shower that compacts the surface. Use a single-horse cultivator to loosen the surface soil after the corn has reached too great a height to use a two-horse cultivator. In dry weather, keep the cultivators in constant use stirring the surface soil, for this maintains the mulch in most effective condition.

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Harrow wheat and oat ground promptly after harvesting, to mulch the surface and prevent loss of soil moisture until it can be plowed. When plowed, float promptly and harrow the surface, unless the soil is light and disposed to blow.

July weather controls the yield of our large varieties of corn. Early-maturing varieties that ripen the first week in July are most to be depended upon. If one variety only is raised, let it be an early-maturing one. If two varieties, give the early variety the largest acreage, and the late variety special attention and good cultivation until ears are well formed.

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The corn plant uses 10 inches in depth of water per acre in making a crop of 50 to 60 bushels, and needs half of this quantity after it begins to tassel; therefore, prepare to store, and work to save the excess of rain in May and June for use of the corn plant in July.—*H. R. Hilton.*

ALFALFA, OR LUCERN.

*(Medicago sativa.)*ITS HISTORY, CHARACTERISTICS, CULTIVATION, WORTH,
AND USES.DISCUSSED BY SCIENTIFIC OBSERVERS AND PRACTICAL GROWERS IN
ALFALFA-PRODUCING STATES AND TERRITORIES.

Probably at no previous time in the history of the central West, or the region west of the Missouri river and eastward of the continental divide, and especially in Kansas and Nebraska, have the agricultural population taken such an intense and intelligent interest as now in the question of what crops are best adapted to their conditions of locality, soil, and climate, and the methods best calculated to give adequate returns for values invested in their production. One of those crops upon which the largest measure of new interest has centered during the past year or more, in Kansas, is alfalfa (also often called lucern); and the yields and profits realized from its growth in many counties, reported by gentlemen of the highest integrity, unmistakably indicate that in this plant, a large area, if not all of Kansas, has an agricultural acquisition of tremendous importance. To aid in disseminating the utmost accurate available information among the people interested, the State Board of Agriculture, with desire to neither magnify nor underrate its importance, has canvassed those most familiar with the subject in its various phases, and in all sections of the United States where alfalfa is cultivated to any considerable extent, including the scientific experimenters, trained observers, and, particularly and largely, the practical producers.

In the doing of this, the names were obtained of many hundreds most largely identified with alfalfa-growing, and to these were sent lists of carefully prepared and exhaustive questions, bearing upon all aspects of the subject, framed to draw out what the recipient had learned or observed, likely to be of practical worth to those contemplating a test of alfalfa on their own account. Very full information was obtained from California, Colorado, Montana, Nebraska, Oregon, Washington, Idaho, Wyoming, and the territories of Arizona, New Mexico, and Utah, and a careful compilation of it, entitled "Alfalfa-Growing," was published in a separate report of 230 pages, by this Board, in November, 1894.

The substance from many of the more representative statements returned is given in the succeeding pages, classified by states and counties. Many other reports were received, but to print all would require more space than could be devoted to them in this volume, and their reproduction would be but to further repeat what will be already found clearly stated here. From the mass of most valuable information contributed, the Secretary has collated the following deductions, intended to be, as a rule, more especially applicable to Kansas than elsewhere :

DEDUCTIONS BY THE SECRETARY.

Alfalfa thrives best in a warm and friable soil, above a subsoil porous or gravelly — the opposite of a stiff, compact clay, "gumbo" or "hardpan," or any stratum

through which the roots penetrate with difficulty, although occasional exceptions to the latter are claimed as having been observed. A sandy loam soil appears to afford the most favorable conditions for alfalfa growth where not irrigated. More than almost any other plant, it depends for its prosperity upon a subterranean rather than a surface water supply.

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For seeding a loamy soil to alfalfa, it should have been in cultivation a sufficient length of time to thoroughly subdue or eradicate its "wild" nature; it should be deeply plowed, and, if not to be irrigated, subsoiled as deep as possible; the surface should be thoroughly pulverized and made smooth by a plank drag or similar implement. In sandy soils, some of the best results have come from seeding on sod, especially where the subsoil is also quite sandy and porous. Such a soil might be injured rather than benefited by subsoiling, and where such land has been in cultivation for several years a thorough preparation of the surface only will probably give best results.

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The seed used should be free from seeds of weeds or other plants, and may be sown either broadcast or with a drill, and should be covered, approximately, with an inch of fine soil. The quantity of seed varies; if the crop is chiefly intended for seed raising, 12 pounds is often found sufficient, while if a fine quality of hay is desired, sometimes as much as 30 pounds is sown; yet 20 pounds or less represents nearly the quantity used by the generality of those who raise the crop for both hay and seed. If sown in the spring, it should be as early as danger from frost is past.

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The permanent and pleasing success or aggravating failure of an alfalfa crop very largely depends upon the conditions attending its first year. If from any of the many possible causes, such as ground poorly prepared, feeble or foul seed, hard freezing, insufficient moisture, or too severe pasturing, an even, uniform and sufficient stand is not obtained the first year, all later efforts to bring it into a satisfactory condition result largely in disappointment. Under even the most favorable conditions, alfalfa cannot be expected to make much showing during its first year.

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Much the largest yearly yields are obtained by irrigation; yet there are extended areas in Kansas and other states where, without irrigation, three (and sometimes more) cuttings annually, amounting to several tons of hay per acre, are obtained, including a crop of 2 to 10 bushels of superior seed.

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Alfalfa will neither flourish nor long survive in a soil with water standing upon or near the surface. It consumes much water, but an excess, either naturally or artificially applied (by too long-continued flooding), is altogether fatal.

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The cultivation for young alfalfa, or rather its kindly protection against being crowded or overshadowed by high weeds, and its encouragement to stool and spread, is the frequent use of the mowing machine with its sickle bar set high enough to prevent cutting near the ground. The clippings made in this way serve, in some degree, as a valuable mulch.

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Under some conditions, sowing alfalfa in connection with a nurse crop, such as oats or barley, is found very satisfactory; this is practiced most in California. These serve to protect the tender alfalfa plants, at a critical period, from injury by the sun. As a pasture plant, alfalfa will scarcely endure as close cropping as clover.

As a renovator and enricher of the soil, it is conceded the equal if not superior of red clover, for, as has been well said, it is "a nitrogen gatherer of the first magnitude, and the long roots draw ash elements from depths where no other crops could feed, storing them up until, by their decay, they again give them up to succeeding crops." Owing to the toughness and size of its roots, it is difficult to plow under, and is eradicated only with much effort. Good examples of alfalfa as a soil improver are seen in Weld county, Colorado, where are raised the large yields of superior potatoes which have made "Colorados" almost a synonym for potato perfection. Although, naturally (under irrigation), theirs are the finest of potato-producing soils, the growers have discovered their gains are greatly enhanced by planting upon land previously in alfalfa—a rotation rapidly being adopted by those most successful.

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Owing to its containing 72 per cent. water, (1 per cent. more than in red clover,) green alfalfa requires care, considerable time and drying weather to evaporate from it the extremely large percentage of moisture necessary to be gotten rid of before it is properly cured hay, and without getting rid of which it is not safe from heating or molding in stack or mow; although, as is well known, a very important drying and curing process takes place after storing hay that at the time appeared far from sufficiently, or even safely, dry. Those who irrigate find it very profitable to flood the ground some little time before each cutting, in order to stimulate and start at once the succeeding growth. The surface should not be wet at the time of cutting, as such a condition seriously interferes with and retards the prompt and thorough curing so desirable for the best quality of hay or seed. As it sheds water but poorly, alfalfa should, if possible, be stored under cover.

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Either green, or cured as hay, the nutritive qualities of alfalfa are surpassed by few other plants, red clover not exceeding it in protein or muscle-forming elements. Farm animals of all kinds relish, and thrive, and, in many instances, actually become quite fat, upon the dry hay alone, and cows kept upon it demonstrate its value for milk making in both quantity and quality of product. It is an admirable crop for soiling purposes.

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To cattle or sheep, unless very gradually accustomed to it, rank alfalfa pasturage, by causing "bloat" or "hoven," is always dangerous, and, in many instances, quickly fatal, if they are given access to it when quite hungry or the alfalfa is wet with dew, rain, or frost. If discovered bloated or bloating, there is but little time for treatment, and prompt puncturing with the trocar or knife must be the chief dependence for relief.

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A proper stand of alfalfa furnishes a great quantity of extremely valuable and much-relished pasturage for swine and horses during a large part of the year, and if the swine are, about once a week, shifted from one pasture to another, when it is all heavily stocked, the change is beneficial to the animals and the pasture. For horses, idle or at slow work, the hay is also highly esteemed, but for those used in rapid driving or road work, it is often found too "washy," or laxative.

The ordinary machinery for thrashing such crops as wheat and oats is unsatisfactory and wasteful for alfalfa, and a separator more of the character of a clover huller is much better adapted to its thrashing. When cured, alfalfa easily drops both its leaves and seeds; hence the gentlest and least possible handling in its care, and prompt storing when once dried, should be aimed at.

The ripened alfalfa from which seed has been thrashed is counted of greatly diminished value by some feeders, yet many others esteem it almost, and some

quite, as highly as if cut earlier for hay alone. That it has considerable feeding value can scarcely be controverted.

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While alfalfa gives sure promise of being indeed a boon to Kansas and contiguous states, there are undoubtedly localities, soils and conditions to which it is but poorly adapted. To be persuaded of its worth and importance does not necessitate accepting, without qualification, the honestly made, well-meant, yet almost incredible statements of yields and profits. Discounted fully one-half they still indicate that, under conditions such as prevail on millions of Kansas acres, alfalfa can and should early become an important factor in our agricultural economy and prosperity. The information is not collected nor published to encourage everybody to rush into alfalfa production with the expectation of making fortunes, nor in many instances equaling the very remarkable results attained by those most successful. On the other hand, if the information proves helpful to the more general and judicious introduction of an additional valuable crop, out of which shall come a better agriculture and a larger return for the money, brain and brawn invested, the effort will have fulfilled its present purpose.

A LITTLE ALFALFA HISTORY.

By Prof. C. L. INGERSOLL, Nebraska Agricultural Experiment Station.

Alfalfa is a plant of the large and valuable botanical family called *Leguminosæ*. The family is so called because of its fruits being in legumes or pods, with from one to several seeds in a pod; as peas and beans have been the type of the family most quoted we are more familiar with them as type plants. The clovers, however, all belong to the family, and form a peculiar but interesting series of plants botanically and practically, as well as chemically. The alfalfa belongs to the genus *Medicago*, while the other clovers are of the genus *Trifolium* (three leaved). *Medicago sativa* is the full scientific name of the plant; and by way of explanation for those who are not informed, and into whose hands this bulletin may fall, scientific names of things in nature are composed of two parts. This first is termed the generic name, and includes a large group of plants, insects, or animals, etc. The second name is called the specific name, and refers to a smaller and more closely defined and described group. The larger, then, is the genus and smaller the species, and the name of the genus stands first. The generic name, *Medicago*, is derived from the Greek *Medike*, spelled medick in botanies, and refers to the fact that the Greeks obtained the plant from the far east, probably from Media, in Asia. It is one of the very ancient forage plants, having been cultivated by Greeks, Romans and Egyptians of very early times, and in the later periods and especially within the nineteenth century, by many nations in the warmer parts of Europe. It has been known in South America for a long time, and has been cultivated especially by the people in the more arid and semiarid regions along the west coast. From this region it was carried to Mexico and California, where, under genial climate and clear skies, it has proved itself to be a veritable Godsend to those people, who, residing there, needed some permanent and reliable forage plant that was adapted to and could stand severe climate where there was prolonged heat and drought.

Alfalfa is rather a slender growing, branching plant, with leaves much smaller than those of the small June and mammoth red clovers; it is of a peculiar dark, rich green color, and is the marked feature of any landscape where one can obtain an extended view. It flowers in a different manner from other clovers, they having the blossoms aggregated or clustered in a somewhat rounded head or bunch. This

has its beautiful small, hooded or pea-like blossoms, purple in color, scattered along the stems, loosely, in what the botanist calls a raceme. Again, as the seed pods form, they are single and coiled spirally, while in red and white clovers they are straight and crowded into a head. The seeds of all clovers are almost alike; in fact, they are so nearly so that many persons cannot tell them apart without very close examination. Like other plants of this group, it has a single long and strong taproot, which throws off numerous small branches or rootlets as it passes downward. It goes to a great depth in search of moisture and usually finds and appropriates it. Roots have been known to penetrate to a depth of over 20 feet in an open, porous soil with no underlying substratum of hardpan. On account of the size, toughness and depth of the root, it is not easily cut or broken; hence the land seeded to alfalfa should be selected with this end in view, of allowing the crop to remain for a series of years. When broken up, however, the soil is in most excellent condition for wheat, potatoes, or almost any crop. Alfalfa is a nitrogen producer, and hence improves the land on which it is grown in this respect. All clovers are found to have small nodes or tubercles upon the roots, and by careful experiment these are found to contain colonies of bacteria; the soil is also found to contain them. During the warm season, when active growth is being taken on, and when nitrogen compounds are being formed rapidly in the soil, the bacteria are most active, and help, it is believed, to form these compounds and to assist in their assimilation in the plant. For this reason all clovers are very valuable, and especially alfalfa, for the express purpose of renewing the fertility of the land.

Our attention was recently directed to the great value to our state if every quarter section of land had 10 acres of as good a forage crop as alfalfa upon it, producing from five to six tons of excellent hay and a good crop of seed. At the present time there is not a crop raised as a farm crop that will pay better returns in cash per acre. Alfalfa with corn should be the watchword hereafter in Nebraska.

THE GROWING AND USING OF ALFALFA.

By B. F. SHUART, Oberlin, Ohio.

My experience as an alfalfa grower extended over 10 years, but was confined to the state of Montana and to the conditions of irrigation. All that I shall say respecting methods, therefore, may not be of universal application. The reader must judge for himself, in view of his particular conditions.

THE SOIL AND ITS PREPARATION.

As a rule, alfalfa thrives best on "bench" lands, and it delights especially in a sandy loam with porous subsoil. It thrives, however, in varying degrees on clay and even "gumbo" soils, especially when the subsoil admits of free penetration by the roots. Where the roots reach a stratum of water, as frequently occurs on bottom lands, the plants are quite certain to winterkill from the bursting of the surcharged roots by the frost. In attempting to raise alfalfa under the semiarid conditions which exist in western Kansas, and without irrigation, a very important point to be considered is, whether the soil from a foot or so below the surface downwards is permanently charged with a fair degree of moisture. In the arid states, the best alfalfa lands, as a rule, are moist, when in their natural state, only to the depth to which the infrequent rains penetrate them. During the summer and fall they are so dry from the surface downward that only grasses which can endure seasons of suspended animation can survive. Alfalfa will ordinarily live through such ordeals, but it

would be of comparatively little value for crop purposes. A moderate amount of rain during the spring would perhaps produce one crop. But where the rainfall is sufficient at any time during the year to keep the subsoil moist to the depth of several feet, even with droughty conditions during the growing season, fairly good results might be expected without irrigation. The best way to determine doubtful points is by experiment on a small scale.

For best results, alfalfa should not be sown until the wild sod has been thoroughly disintegrated by one or two grain crops. Beginners too often make the mistake, in their anxiety to get alfalfa started, of undue haste, and of slipshod methods in preparing the soil and sowing the seed, and they invariably pay the penalty of partial or complete failure. And this is no light penalty, for, aside from the loss in yield and quality, a thin, straggling stand of alfalfa is an eyesore and a nuisance, to be avoided at any cost of painstaking and care. The soil should, therefore, be first thoroughly subdued. When it is ready for laying to alfalfa, it should be given a deep plowing in the fall, and in the spring should be carefully pulverized by the use alternately of the harrow and of the plank drag or clod crusher. Then the land should be carefully graded to a surface so uniform that water will require no other influence than gravity to distribute it evenly over the entire field. Let no one make the mistake of seeding down rough, uneven land, for the labor and cost of grading, once for all, are trifling compared with the aggregate loss incurred in irrigating such land twice or thrice each season, for an indefinite number of years.

IRRIGATING BEFORE SEEDING.

After the land has been graded, and immediately before sowing the seed, the land should be copiously irrigated. Irrigation at this stage serves a threefold purpose: (1) It reveals the high spots, if any remain, and these should be worked down and irrigated. As soon thereafter as the soil will bear working the seed should be sown. (2) Irrigation before seeding insures the prompt and complete germination of the seed. This is a point of vital importance, for without a dense and uniform stand of plants it is not possible to make a high quality of alfalfa hay. If the stand is thin on the ground the stalks will be coarse, woody, and indigestible, and in curing the leaves will dry and fall off before the stems are sufficiently cured. But if the stand is thick the stems will be fine, and the foliage will be so abundant that the curing process can be effected evenly and without perceptible loss of leaves.

One who has not had experience in feeding alfalfa, especially to sheep, cannot realize the immense superiority for feeding purposes of a high quality of alfalfa hay, such as I have described, over a coarse, stemmy quality, and the substitution of the one for the other will produce a marked change in the general appearance of a band of sheep within 48 hours.

In starting alfalfa, I am aware that the almost universal practice is to trust to the fickle and scanty showers for moisture, or, in the absence of these, to sheer luck. Doubtless now and then a fairly satisfactory stand is secured in this way. I followed this system myself during the earlier years of my experience as an alfalfa grower, in Montana, with the result that fully one-half my efforts resulted in flat failures, while I never, in a single instance, attained to a degree of success comparable with that which I realized uniformly after I began to irrigate before seeding. Judging from an observation of alfalfa fields in several of the arid states, I am forced to believe that the great majority of alfalfa growers are practically ignorant of what constitutes a strictly first-class stand of alfalfa. And this because the system of seeding in vogue is one which depends for its success upon a combination of favoring conditions which rarely happens. The danger is, when rain is de-

pended upon, that the sun and wind will dry out the soil to the depth of the seed before it can take sufficient root to survive. I have had whole fields perish in this way before the seed was well sprouted. But irrigation immediately before seeding completely obviates this danger, by supplying the soil with a fund of moisture, compared with which a copious shower is a bagatelle, and which causes the seed to spring with a rapidity and completeness scarcely attainable otherwise.

A third advantage secured by irrigation before seeding is, that it supplies the earth with a reservoir of moisture sufficient to sustain the plants in unchecked and vigorous growth until they are strong enough to bear irrigation without injury. The critical time with alfalfa is the first six weeks of its growth. Flooding during this period is quite certain to give the plants a backset, from which they seldom fully recover before the second, or sometimes not until the third year. And it is not often that, in the arid states, the rain falls with sufficient frequency to dispense with the necessity for irrigating the plants during this period. By soaking the earth before seeding, however, the plants will make vigorous growth until they are 10 to 12 inches high, after which they may be irrigated with safety. Under this system, I never failed to take two crops the first season, aggregating, perhaps, $1\frac{1}{2}$ tons to the acre in two cuttings, provided the seeding was done not later than the 20th of May. From the first crop of the second season onward the yield was full-fledged.

TIME AND MANNER OF SOWING.

Alfalfa should not be sown until the danger of hard frost is past. I have seen very young alfalfa survive frost, and I have seen it completely destroyed by it. It is not prudent to take the risk.

A point scarcely second in importance to that of irrigation before seeding is that of burying the seed to a sufficient and uniform depth. For this purpose I know of nothing equal to the press drills, although any good grain drill will answer. The seed should be put into the grain box and be run down the spouts. But with the drill, great care must be taken not to bury the seed too deep, for too deep seeding is quite as fatal to success as too shallow. A depth of two inches is about right. Whatever implement may be used for covering the seed, it should be followed by the plank drag to smooth and compact the surface. When the drill is used, 20 pounds of seed should be sown per acre; but if broadcasted, 30 pounds should be used. Great care should be exercised, in the selection of seed, to see that the grains are plump and healthy, and that it is scrupulously clean. If it contains many shrunken seeds reject it, for if they spring at all they will produce only puny, worthless plants.

After alfalfa has become established, a single copious irrigation after each cutting will ordinarily be found sufficient. Irrigation before cutting is undesirable, because it leaves the earth so soft as to interfere with the movement of loads.

MAKING ALFALFA HAY.

The conversion of a heavy mass of green alfalfa into a choice quality of hay is an operation calling for no small degree of skill and experience. But the process is one to be learned by intelligent observation and practice, rather than from written description. The first and second crops of each season need to be cured with special care or they will certainly mold in the stack. Beginners need to beware on this point. The knack to be acquired is that of curing the hay sufficiently to insure its keeping sweet in the stack without becoming so dry as to shed its leaves in the handling. This cannot possibly be accomplished by curing fully in the swath. A method much practiced is to rake the alfalfa while still quite green into windrows, where it is allowed to cure somewhat more, and finally to make it into moderate-sized cocks, in which it is allowed to stand until ready for the stack. This process makes very nice hay; but where a large acreage is to be taken care of, it is too slow

and expensive. Alfalfa may be cured with entire success in the windrow, but it is important, when cured in this way, that there be ample facilities for putting it into stack very rapidly when ready; otherwise it will become too dry, and much of it will be lost in the handling, especially if it has to be carried from the field on wagons. Alfalfa should be cut on the first appearance of bloom.

After trying a variety of appliances for stacking alfalfa, I found the so-called table rakes (which are simply an improved form of the old "go devil"), and the ricker which supplements them, the best suited to my conditions. By means of these rakes the hay was taken from the windrow by horse power, and was conveyed to the stack in masses weighing from 200 to 400 pounds, was there delivered to the ricker, and was by the ricker landed into the middle of the stack. The only hand power required was for the distribution of the hay after it was placed upon the stack. Five men and five horses, with two rakes and the ricker, easily put 30 tons of hay per day into stack, at a cost, as wages were, of about 35 cents per ton.

The great drawback to these rakes is that they can be used to advantage only on short hauls. The plan on which I had laid out my farm happened to be one, however, perfectly adapted to their use. The special feature referred to was a system of parallel roads running through the farm about 30 rods apart. These roads were protected from the irrigation water by ditches on either side, and the fields consisted of the long and comparatively narrow belts lying between the roads. The alfalfa was cut in blocks of about 10 acres, and was stacked on the road immediately adjacent. The stacks were thus distributed on the roads all over the farm, but as the hay was used for feeding stock this arrangement was not objectionable, while it reduced the cost of moving the hay, during the most busy season, to the minimum.

I have received many requests from men who are bringing new lands under alfalfa for helpful suggestions as to how to proceed. Were I to attempt to condense my advice into a brief paragraph, I should say: First, subdue your land by one or more grain crops; then carefully lay off your farm by a system of fields and of roads, having special reference to convenience and economy in handling the crop. Next, grade your fields so perfectly that, in irrigating, when you shall turn the water from the ditch gravity will do the rest. Then irrigate your land and sow your seed. And, finally, let there be one man on the place who shall make it his business to master the details of irrigating, curing and stacking alfalfa, and who shall exercise personal oversight of these processes; and let this man, if possible, be the proprietor himself.

ALFALFA AS PASTURE.

Alfalfa is not safe, as pasture, for either cattle or sheep. I tested this matter with sheep under various precautionary conditions, until forced reluctantly to conclude that the only safe way was to keep my herds off the alfalfa fields entirely. It is true, however, that both sheep and cattle will sometimes feed on alfalfa pasture for days together without ill consequences, but, sooner or later, the lightning strikes, and it may strike hard. I had a neighbor in Montana who had a little band of sheep which he turned onto alfalfa pasture with apparent impunity, until he became convinced that it involved no danger whatever, and who freely pooh-poohed the idea of its being unsafe. One day, however, he noticed that something was wrong, and, hastening to the field, he found them all inflated like balloons, while several of them were already dead. He afterwards told me that, as he hustled them off to the corral, they dropped so fast that he thought they would all be dead before it was reached. I have heard many theories as to the conditions under which sheep might be safely pastured on alfalfa, but, subjected to practical test, they all failed. Nor did I ever succeed in saving a sheep after it was once down

with bloat. As pasture for cattle, while alfalfa is not safe, I found it to be less dangerous than for sheep. I considered my alfalfa meadows too valuable to be trodden up by heavy stock, and, therefore, did not allow cattle on them very much. One season I allowed calves and yearlings to feed on the aftermath, and while some of them got hoven almost daily, none of them died. When I discovered them, I would make an opening into the paunch, on the left side, with my pocket knife, which gave immediate relief, and in a short time they would get up and resume eating. They most frequently have recovered, however, without such assistance.

Horses and swine can be pastured on alfalfa with entire safety, and with the most profitable results. For growing colts it is superb, but for horses that are working it is of course too washy. Alfalfa is so rich in the albuminoids that colts can be grown to larger size and better bone on it than on almost any other food. As a food for swine, green alfalfa goes far toward solving the problem of making hog raising a profitable industry for the arid states. If properly handled, pigs will make rapid growth on green alfalfa from the time they are weaned until they are ready to be finished off in the fall, when grain should be added. But by far the best method of feeding green alfalfa is by soiling. Pasturing I found unsatisfactory for a number of reasons: It is, first of all, a very wasteful system, as the animals destroy with their feet much more than they eat; if the alfalfa is irrigated, it involves the necessity of at least two pastures, in one of which the stock can be run while the other is being irrigated; it necessitates the keeping of rings in their snouts all the time, which requires ceaseless vigilance and a great amount of trouble. The cool, moist soil of an alfalfa field, after irrigation, is an irresistible temptation to the burrowing propensities of a pig, and in the latter part of the summer, not content with the herbage, he will uncover and devour the roots of the alfalfa to the depth of from 6 to 12 inches, killing it of course. And, finally, alfalfa grows so rapidly that it soon passes its best stage for pasture, and young stock, the digestive powers of which are not fully matured, will then not thrive so well.

Soiling completely obviates all these objections. That I might avail myself of this system to the greatest advantage, I confined the stock in a dry yard adjoining a patch of alfalfa. The yard contained shelter from the hot sun, and had a constant supply of fresh water from an irrigating ditch for the stock to drink. The stage at which the alfalfa was fed was when it was about a foot high; and, by cutting in rotation, this tender and nutritious quality of feed was available through the entire season. The stock never cloyed upon it, but ate it with the keenest relish, and made steady and satisfactory growth. The function of alfalfa, as a feed, is to promote growth, rather than to lay on fat, and hence, in the fall, fattening foods should be added. The objection which will appear to soiling is, that it requires so much personal attention. My experience was, that, in the aggregate, it required less than pasturing; for when my hogs were in pasture they managed, in one way or another, to keep us in hot water nearly all the time. Soiling, however, requires one man's attention three times a day simply to mow the grass and throw it over the fence to the stock, which, in actual practice, will be found to be but a small task.

FEEDING ALFALFA HAY.

Although I had an abundance of timothy and of blue stem, I fed alfalfa hay to my work teams the year round, of choice, because I found that I could keep them in good, hearty condition on at least one-third less grain. Horses should be fed only hay made from the first crop of the season, and, if it is not cut until well into blossom, it will, for horses, make the better hay. The later and softer crops, while excellent for other stock, have a tendency to scour horses. The current belief that

alfalfa injures horses by overstimulating the kidneys, etc., is sheer moonshine. For driving stock, when in service, it is less desirable than timothy or blue stem.

As a winter feed for sheep, alfalfa hay, on account of the cheapness with which it can be produced and its high nutritive ratio, is simply peerless. But for the best results the hay should be of the highest quality. The first winter that I fed sheep on alfalfa, I fed a band of fine grade yearling Merino wethers for mutton. They were in good condition when brought from the range, and were fed freely of the best quality of hay. In addition to keeping them fat, it stimulated the growth of wool, so that, after having been topped all winter by the mutton buyers, the band, at shearing, averaged a little over 12 pounds of wool per head. The man of whom I bought the band had bred them himself, and was a very experienced flock master. By comparison of the yield of wool with that of his own sheep, of similar grade, which were run on the range during the same winter, he estimated that the alfalfa had increased the average weight of the fleeces about $2\frac{1}{2}$ pounds. In subsequent years I fed lambs chiefly, and sought only to keep them in thrifty, growing condition. A given amount of hay could be made to go considerably farther when fed with this end in view than when the object was to make mutton. Under this system, and with growing lambs, the increase of the fleece was less conspicuous — probably not exceeding one pound per head. I kept my sheep in corrals (with sheds adjoining) through the entire feeding season, which, in the Yellowstone valley, lasted from 80 to 100 days, and fed them twice a day. A ton of hay per day sufficed for each 1,000 head, and three men could take care of from 5,000 to 6,000 head.

I found alfalfa hay, when run through a chopping machine and wet up with oat or barley meal, a most admirable food for brood sows both before and after farrowing, as well as for the young pigs until old enough to go onto green alfalfa diet alone. Hogs will eat a moderate quantity of choice alfalfa hay daily, with good relish, and I always made it a part of their daily ration.

ALFALFA—ESPECIALLY IN KANSAS.

By PROF. C. C. GEORGESON, Kansas State Agricultural College.

Alfalfa is already well known in Kansas, and does not need a detailed description. It is often called "alfalfa clover," because of its resemblance to clover, having a pea blossom and a leaf of three leaflets. It is becoming more and more esteemed, and a farmer who has a suitable soil and tries it once is likely to continue its culture.

In comparison with the grasses, it possesses some advantageous properties. It sends its roots deep into the soil, and, for this reason, is less dependent upon the rainfall than almost any other farm crop. It is a perennial plant, and, once established in a suitable soil, it will continue to yield paying crops for an indefinite number of years. It is, in common with the clovers, a nitrogen gatherer, and enriches the soil in this element, while the deep-growing roots gather potash and phosphoric acid from the subsoil, and bring them to the surface in its stems and leaves. For this reason, the surface soil may be enriched in all the essential fertilizing elements by plowing a crop of alfalfa under, and when the roots finally decay they leave air passages deep into the soil by which nitrification and decomposition of soil particles are aided. The clovers, although of the same nature, neither last so long nor do they yield so much of either fodder or fertilizing matter as alfalfa. Moreover, alfalfa will grow in regions where the clovers fail, and, for this reason, it plays an

important part in the agriculture of the western two-thirds of the state, where clover is more or less uncertain.

Alfalfa-growing may be studied under three conditions: First, under irrigation; second, on the lowlands without irrigation; and third, on the uplands without irrigation.

That alfalfa succeeds under irrigation, is a fact so fully established that it requires little discussion. It is extensively grown under this system in Colorado, Utah, California, and in fact everywhere where irrigation is practiced.

Since there is as yet but a very limited area of Kansas, according to the present outlook, that can as yet be irrigated, it is of special interest to note how far this crop can be made a success in the semiarid region without irrigation. It is, therefore, chiefly the second and third aspects of the case which draw our attention. That alfalfa may be grown on certain favorable lowlands in the west without irrigation, is a fact established by thousands of acres now under successful culture in western Kansas, but the yield varies with the situation. A large proportion of the "bottom" lands in that region have a porous, sandy subsoil, through which the waters of the streams percolates with ease for long distances, forming the so-called "sheet water." This water is, in some places, within three or four feet of the surface; in others, it is 10, 12 or more feet below. On such lands, where the roots penetrate with ease to the water, alfalfa is successfully grown.

In the third situation, on the uplands without irrigation, the conditions are not so favorable. The soil here is, as a rule, very fertile, with a beautiful, gently undulating surface, but with a rainfall of less than 25 inches. These uplands cannot be cultivated in the same crops and in the same manner that farms are cultivated further east, where the rainfall is greater. To the question if alfalfa can be grown on these uplands, the answer must be a qualified affirmative. Actual trials in many places, have demonstrated that alfalfa can be grown there, but the yield in forage is not to be compared with the yield on the lowlands. In the first place, the obtaining of a good stand is attended with more difficulties. If the rain in the early part of May is sufficient only to germinate the seed, but not enough to sustain the young plants until they get a foothold, the stand will be light, and it may, sometimes, require two or more seedings before the crop is well launched.

Again, the growth the first year is feeble, and nothing either in the way of pasture or hay, can reasonably be expected from it the first season—no pasture, because it would kill the crop to turn stock on it; and no hay, because the growth is too light. The second, third and succeeding years it will yield increasingly good pasture, but it is only in favorable seasons that it will produce fair hay crops. Under the conditions named, it is, however, a great thing for the plant to live and yield pasturage, for as pasturage it far exceeds the wild grasses, both in quantity and quality. There is no better pasture for horses, hogs, and sheep, nor indeed, for cattle, except that it often causes them to bloat, and for that reason it is safest not to pasture cattle on alfalfa. This upland alfalfa has one other good feature: it yields seed of superior quality, though in moderate quantity.

Combining these features—a good pasture, an occasional hay crop, a producer of good seed—and adding to these its manurial properties, which, as we shall see, are by no means its least virtue, we have in alfalfa a better forage plant for the greater part of the state than any other perennial that has yet been brought to our notice.

There are places where alfalfa cannot grow, regardless of the climate. Wherever there is an impervious clay, the so-called gumbo, or a layer of hardpan or rock, within a few feet of the surface, it will be a total failure on the uplands and but a very indifferent success on the bottom lands. The same is true on the bottom lands.

where the soil water stands too near the surface, or where it is overflowed for considerable periods.

For successful seeding, prepare a good seed bed by whatever means may be found most expedient. In most cases I should prefer to plow in the fall, or, in localities having a light soil, with dry and windy winters, early in the spring. Pulverize the surface well; then seed any time in the spring after the danger of killing frosts, which would injure the germinating seed, is past.

On the uplands, I would sow not less than 25 pounds of seed to the acre, and on the lowlands, 20 pounds. In a wet spring I should prefer to sow it broadcast, either by hand or with a seeder; but wherever the rainfall, to start the seed, is uncertain, I would drill it in, using an ordinary grain drill, and cross drill the field, sowing one-half the required quantity of seed per acre each way. Cover the seed well with some implement that suits the nature of the soil. If broadcasted, a disc harrow run shallow will afford the best covering. Then apply a heavy roller. On the uplands, it should always be sown by itself. If sown with a grain crop, the young plants are almost sure to be killed by exposure to the sun after the grain has been harvested. On irrigated land there is less danger of this, and the seed may be sown with some spring crop.

Although the spring is the usual season for sowing alfalfa, it may be successfully sown at other seasons. Many farmers prefer to sow in early fall, so that the young plants get a good start before winter.

I have tried to seed alfalfa in corn, covering the seed with the last cultivation of the corn, but this proved a complete failure. The seed came up promptly, showing an excellent stand, but when two inches high it began to die out, and long before the corn was ripe I could scarcely find a spear to show that it had been seeded to alfalfa. I am unable to explain this failure, but surmise that the corn shaded it too much, and subsequent dry weather caused the spindling young plants, in the loose, porous soil, to die out.

Alfalfa is nowhere grown more successfully in this state than in the Arkansas valley. A large grower, near Hutchinson, informed me that he had seeded alfalfa successfully in every month through the summer, and he preferred to sow on the inverted sod at any time, as soon as plowed, as he never failed of a stand in that locality. This new ground had the advantage of being free of weeds. Seeded on old ground, it is essential to keep the weeds under by mowing several times during the season; otherwise they may entirely choke out the alfalfa.

On rich soil, one, or even two, crops of hay may be taken the first year. On upland, or in dry seasons, it may not yield anything the first year. The second and succeeding years, it will yield three, and sometimes four, crops of hay each season. It should be mowed every time it begins to blossom, no matter how short it may be. It does not grow any taller after it begins to bloom, and if allowed to form seed the stems will be woody and it will drop its leaves. The hay is very brittle and the leaves, the best part of it, break off easily in handling. To diminish this waste, it must be cured with care. The best practice is to rake in the afternoon what has been cut in the forenoon, put it in good-sized cocks and let it cure there before it is stacked. If the crop is light and the sun strong, the rake may follow soon after the mower. If dried too much in the swath, there will be little besides the dry stalks left when the crop is raked. To keep the alfalfa hay well, the stack must be covered, or it must be housed. It does not shed rain well, and a single soaking rain may cause it to mold and spoil.

When seed is desired, it is usual to take it from the second crop, though sometimes the third crop is allowed to go to seed. It is rarely the case that the first

crop seeds well. The insects which aid in fertilizing the flowers are apparently not present in sufficient numbers when it first blossoms, in May.

The yield of seed is very variable; it may range all the way from nothing up to 15 bushels per acre. The latter yield, I am informed, has been obtained on more than one farm in western Kansas. The seed has, so far, met with ready sale at from \$3 to \$6 a bushel.

As regards its nutritive qualities, there are but few plants that can compare with alfalfa. Red clover is the best known and most universal leguminous plant. For the sake of comparison, I quote the following analyses of the two from Wolf's table. The figures refer to the digestible nutrients in each case.

NUTRITIVE QUALITIES.	RED CLOVER. Quality very good.		ALFALFA. Quality very good.	
	Hay.	Green. In blossom.	Hay.	Green. In blossom.
Crude protein.....	8.5	1.7	12.3	3.2
Carbohydrates.....	38.2	8.8	31.4	8.1
Fat.....	1.7	0.4	1.0	0.3
Nutritive ratio.....	5.0	5.7	2.8	3.1

It will be seen that alfalfa, either as hay or green, contains more of the most valuable nutrient (protein) than red clover. The figures speak for themselves. Further argument on that point is unnecessary.

As a fertilizer of the soil, alfalfa has but few equals, and, although it is a perennial crop, the farmers are beginning to learn that it pays them, on poor soil, to plow a crop of alfalfa under, in order to enrich the soil. The New Jersey experiment station has experimented, on a small scale, with alfalfa from this standpoint, and in the report of that station for 1889 is given a resumé of the results, from which I quote the following:

"The amount of plant food collected from one acre, and its value, on the basis of the prices per pound of plant food for the years 1887, 1888, and 1889:

DRILLED PLAT.	POUNDS PER ACRE.			Fertiliz- ing alue.
	Nitrogen.	Phos- phoric acid.	Protein.	
In 1887.....	253.6	45.7	286.9	\$57 70
In 1888.....	299.2	52.4	292.2	66 30
In 1889.....	360.0	63.0	355.5	89 44
Totals.....	912.8	161.1	934.6	\$213 44

"The demands made upon the potash in the soil is especially noticeable, the quantity removed being almost equivalent to one ton of high-grade muriate of potash. There had been applied, since the seeding of the crop, less than 200 pounds of actual potash. Since alfalfa is a deep-rooting plant, it is quite likely that large quantities of this element had been secured from the deeper layers of subsoil. At the prices of nitrogen, phosphoric acid and potash assumed in estimating the values of commercial fertilizers, during these years the amounts of plant food secured would have cost, in the market, \$213.44."

With such qualities as a feed and as a fertilizer, and the ease with which it can be grown, it would seem that every farmer who has a suitable soil should endeavor to grow a field of alfalfa.

I find no record of alfalfa having been experimented with as an ensilage crop. This is doubtless due to the fact that as yet it is not grown to any extent in the regions of the country where dairying is practiced and ensilage most used, as well as to the fact that corn is so satisfactory as an ensilage crop that there is but little demand for anything else for that purpose. But there is no reason whatever why alfalfa should not make excellent silage when cut and put in at the time it is in best condition for hay.

The query being propounded as to whether alfalfa contains the same fertilizing properties as red clover, he makes this reply:

"By this, I suppose, is meant, first, whether the fertilizing material gathered by the two plants consists of the same elements; and, secondly, whether they are collected in as large quantity by alfalfa as by red clover.

"In reply to the first point, it is to be noted that there are but three elements of plant nutrition which are essential as fertilizers for the soil. These are nitrogen, potash, and phosphoric acid, and, since they are necessary to the growth of all agricultural plants, they are supplied by all plants used for green manure of whatever kind, though in greater or less quantity. They are found in both clover and alfalfa.

"As regards the second point, analysis shows that alfalfa is somewhat richer in these three fertilizing elements than clover, and that it is therefore a somewhat better fertilizing plant. The two plants contain the following elements, in per cents., at the period when they begin to bloom:

	<i>Alfalfa.</i>	<i>Clover.</i>
Water.....	74.00	80.00
Nitrogen.....	.72	.48
Ashes.....	1.92	1.37
Potash.....	.45	.44
Soda.....	.03	.03
Lime.....	.85	.48
Magnesia.....	.09	.15
Phosphoric acid.....	.16	.13
Sulphur.....	.11	.04
Silica.....	.18	.04
Chlorine.....	.06	.05

"It will be seen from the above that the alfalfa contains half as much again of the nitrogen as the clover, and that it has rather more phosphoric acid and slightly more potash than the clover. From this we may infer that, if plowed under at the stage mentioned, namely, the beginning of blossoming, the alfalfa will be a better fertilizer than the clover.

"There is another feature, however, concerning which analysis tells us nothing. That is, the value of roots as fertilizers. In this respect, also, it will be safe to assume that alfalfa stands first, although both are deep feeders and alike provided with extensive root systems; but clover is a biennial plant, while alfalfa is perennial, and probably the latter would not be plowed under until it was several years old; and since the roots continue to extend in depth and enlarge in size with age, the alfalfa would have the larger root mass of the two; and since much of the nourishment used to build up these roots has been drawn from depths beyond the reach of common field crops, the larger roots would, on their decay, leave more fertilizing elements in the surface soil than the smaller roots produced by the clover. And, after all, it is the roots and stubble which yield the fertilizing elements, as in most cases the farmer will hesitate before he plows under a good crop of clover or alfalfa which stands ready for the mower."

ALFALFA, OR LUCERN (*Medicago sativa*)—ESPECIALLY FROM A UTAH STANDPOINT.

By A. A. MILLS, superintendent of farm and experiment work, Utah Agricultural College, Logan, Utah.

History tells us that this plant was grown in Asia and Europe ages ago, and from there was introduced in the western hemisphere in South America. From South America the Spaniards brought it to California. From California it has traveled eastward, until there is hardly a state or territory in which at some time or other it has not been tried with more or less success. It seems, however, to have found the conditions best suited to its growth and development in the mountain region of the West. Here it threatens to replace all other forage and hay plants, owing to its easy culture and mammoth growth.

The plant sends out a large taproot, which, under favorable conditions, grows to an enormous size and great length. This root has often been found down as deep as 10 or 15 feet, and many have reported it as being found as deep as 50 feet. From this peculiarity of growth it is supposed to get one of its prime food qualities. This long root is supposed to furnish it both with food and water from great depths. As to the water furnished by the roots, I believe this is overestimated. Though alfalfa stands drought some better than do the clovers, the difference is not as much as is generally supposed.

Alfalfa shoots up early in the spring, growing very rapidly, and may be cut at any time, from which it recovers rapidly, provided there is an abundant supply of water furnished. It sends up a stiff stem, which is one of its worst faults when grown for hay. The leaves, when dry, fall readily from the stem; hence, in making hay, great care must be exercised in order that the leaves be not lost.

SOIL.

The kind of surface soil necessary for success varies between wide limits. Although the returns are much better on a rich soil, the plant proves to be a great boon on the poorest kind of gravelly soils—soils that are next to useless for any other kind of plant growth. In Utah, alfalfa will produce as much dry hay, of good quality, on the sidehills and on poor gravelly benches, as do the common grasses, wild grass, timothy, and redtop, in the much richer valleys. This fact has led to the belief that the plant is independent of the surface soil, some going so far as to say that the poorer the soil the better the crop. This is a mistake, as it does better on a rich soil.

The subsoil, however, has much more to do with the crop than has the surface soil. Here the limit of possible profitable culture is reduced to a narrow margin. On account of its large, long roots, the subsoil must be porous and open. This porosity may be due to coarse gravel and bowlders, with but very little other material, or to fine sand just coarse enough to allow the free passage of water, or to any grade between these two conditions. Yet it is generally found that the subsoil on which the plant does best is a very open one, containing gravel. A clay subsoil impervious to water, or a "hardpan," is generally conceded to be next to a barrier to success; the subsoil, too, must contain no soil water. If the soil water stands for any considerable length of time higher than five or six feet below the surface of the ground, the crop will be very materially affected and exceptionally liable to winterkill. Permanently wet ground of any nature is detrimental.

For seeding, the soil is best prepared by being put in a first-class condition, as for other grass seed, and clean seed is all-important; many kinds of weed seeds are liable to be mixed with the alfalfa seed. These are all more or less harmful, but

those to be most watched for and avoided are the seeds of the dodder plant, or "love vine." This seed is much smaller than that of the alfalfa—so much smaller that the difference may be observed by the naked eye. Then, too, the dodder seed is covered with small "specks," which may be observed by the aid of a pocket lens. All alfalfa seed should be examined, in order that none be used which contains the dodder. Seeding is generally done in the spring. In this region it is thought that the spring is the best time, which is likely the case, as irrigation takes it through the dry season. When sown in the spring, the best time is just as soon after the danger of frost is past as possible. However, in Kansas, I am inclined to think that early fall would be the best time. If sown then, it would need to be sown early, so as to get a good fall growth, or else there would be great danger of winterkilling. Should it live till spring, then the early spring rains would give it a good start, so that when the hot summer sun strikes it the plant will be in a good condition to withstand the dry weather and heat. Aside from this, it will get started in one year's less time.

The first year's treatment is important, but, as a rule, quite simple. The weeds are kept out with a mowing machine with the cutter bar set quite high, so as to cut the weeds but not the alfalfa. Cutting twice in this manner will usually be found sufficient. After this—late in the fall, just before frost—a moderately good crop of hay may be cut.

After once started, alfalfa has few enemies that make any inroads on it to speak of. The dodder is the only serious weed that it has to contend with. Should the dodder be present, it is said that sheep will eat and kill it out. A surer way is to cut the infested parts when the crop is about two-thirds grown, and, after drying, burn on the ground. This is said to kill the dodder without injury to the alfalfa roots. In ground with a porous subsoil, alfalfa seldom, if ever, winterkills, but if the ground retains too much moisture, the alfalfa is almost sure to winterkill during any of the moderately hard winters. This will occur either if the ground below and damp, if it be underlaid with an impervious stratum, or if the surface water falls faster than it can be absorbed by the soil. Whatever be the cause of too much water during winter, bad results are sure to follow.

Where irrigation is possible, the alfalfa crop responds readily to this treatment. Its natural home is on a loose, dry soil, so that during the growing season much water is required, though, like all other crops, it may be overirrigated. Yet, if the soil be of the proper texture, it is found that the yield will vary about as the water is applied. Generally the first crop can be nearly grown without irrigation. This being the case, it is best to irrigate just previous to cutting each time, so that the succeeding crop may get an early start. If the irrigation is deferred until after the crop is cut and gathered, there will be a week or more of time lost with the succeeding crop. However, if the growth is very rank and thick, this treatment will not do, as the ground will be so damp that the hay will not cure. Judgment must be used as to the best time to irrigate. Irrigation during the first year is best done as late as possible the first time, so the plants may be well rooted and not liable to wash out. In later years the quantity of water required will be greater, varying with the quantity of hay taken from the soil. The quantity of water for each irrigation is generally that by which the ground may be easily covered by the common method of flooding. This we have found to be about $3\frac{1}{2}$ inches; that is, the ground must be covered by this much water.

The proper time to cut depends on the feeding value of the hay at its different stages of growth and upon the yield per acre. Really, the question is, at what stage will an acre yield the most beef, milk, etc.? Here it is cut from two to four times in a season—from the first of April until the middle of October. In varying

the crops in a season from two to four, it necessitates the cutting when nearly out of bloom for the two crops, when in about half bloom for the three crops, and long before bloom for the four crops. At whatever stage it is cut, great care must be used in curing. If left to cure in the swath, the leaves fall readily, and are lost, while the whole plant is more or less bleached. As soon as partly dry rake into small bunches, and leave to cure. This will require from one to five days, according to climate and weather. It is generally supposed that the oftener it is cut, or, rather, the more times it is cut in a season, the greater will be the yield.

In 1893 we rented a five-acre piece of alfalfa, and divided it up into six equal sections. Two of these sections were cut before bloom, two at full bloom, and two when going out of bloom. The first two series were cut three times, and the last but twice. In 1894 the experiment is being repeated at this time of writing, except that another five-acre piece was divided into but three sections. The yields are as follows, in pounds per acre:

WHEN CUT.	1893.	1894.	Average.
Just before bloom..... lbs.	7,182	9,487	8,334
At full bloom..... "	7,158	10,761	8,959
When going out of bloom..... "	7,122	8,095	7,608
Averages.....	7,154	9,447	8,300

As will be seen, in 1893 there was very little difference in the yields, while in 1894 there was over 1½ tons more from that cut at full bloom, and therefore cut three times, than that cut past bloom and cut but twice. Other things being equal, the difference in yield would hardly pay for the extra expense in cutting, as will be seen by the average for the two years. In 1893, the season was very short, and the two cuttings covered the whole season, while in 1894 the season was longer, and the two cuttings did not cover the season. So, we may conclude that the total crop will remain the same, regardless of the number of times cut, provided the cuttings cover the whole season, and that there is no advantage, but a loss of both time and hay, by excessive cutting. The yield is slightly in favor of cutting at full bloom.

WEIGHTS—1893-'94.	FIRST CROP.			SECOND CROP.		
	Early cutting.	Medium cutting.	Late cutting.	Early cutting.	Medium cutting.	Late cutting.
Weight of three steers at beginning... lbs.	2,193	2,221	2,256	2,213	2,117	2,208
Weight of three steers at close..... "	2,340	2,264	2,318	2,354	2,259	2,240
Gain of three steers Dec. 20 to Feb. 21, "	147	43	62	141	142	32
Gain per day per steer..... "	0.778	0.234	0.328	0.743	0.751	0.169
Food eaten per day per steer..... "	15.16	14.33	15.42	15.53	16.02	14.42
Food eaten for one pound of gain.... "	19.48	61.23	47.01	20.90	21.33	85.32
1894-'95.						
Weight of two steers at beginning... lbs.	1,858	1,980	1,936	1,856	1,884	1,875
Weight of two steers at close..... "	1,930	2,069	2,034	1,964	1,950	1,838
Gain of two steers Dec. 29 to Jan. 30, "	72	89	98	108	66	*—37
Gain per day per steer..... "	1.12	1.39	1.53	1.69	1.03	*—0.58
Food eaten per day per steer..... "	17.50	19.70	18.85	19.27	18.09	13.26
Food eaten for one pound of gain.... "	15.62	14.17	12.32	11.40	17.56	*.....
AVERAGE—BOTH SEASONS.						
Gain per day per steer.... lbs.	0.95	0.81	0.93	1.22	0.89	*—0.21
Food eaten per day per steer..... "	16.33	17.01	17.13	17.40	17.05	13.84
Food eaten for one pound of gain.... "	17.19	21.00	18.41	14.26	19.16	*.....
Averages for both crops and both seasons:						
Pounds of food for one pound of gain.....				15.72	20.08	†.....
Pounds of beef from one acre.....				530	449	†.....

* Loss; this cutting was ruined by rain after cutting. † Loss.

As stated before, the question as to the best time to cut must be answered by the pounds of beef, mutton, or butter fat, as the case might be, produced from an acre of ground. To determine this as far as possible, 18 head of steers were divided up into six sets of three each. These were fed on the different cuttings of the different crops, without grain or other feed. This feeding extended from December 20, 1893, to February 21, 1894 — just two months.

From these tables, it would appear that the early cutting is much the best, as over 18 per cent. more beef was obtained from an acre cut early than from an acre cut at the medium stage, while there was not as much material handled. These results are drawn from two feeding trials, and it is thought that they strongly indicate that the alfalfa must be cut not later than when beginning to bloom, and in no crop must it be allowed to grow old and stalky. The feeding value of the different crops, too, is a much-mooted question. From the previous tables, the following is compiled:

AVERAGE GAINS FOR BOTH SEASONS.	<i>First crop.</i>	<i>Second crop.</i>
Average gain per day per steer.....lbs.	0.90	0.63
Average gain per day per steer, cut at best time—before bloom.....“	0.95	1.22
Average pounds of food for one pound of gain, cut at best time—before bloom, “	16.33	17.40

This shows but very little choice between the first and second crop, either taken as an average or at the best stage of its growth. The question, however, requires further study. As will be seen, the average of our feeding shows that, when fed alone to steers, alfalfa will produce from one-half to over one pound in gain per day. The only other results I find from feeding alfalfa are from Arizona, and published in bulletin No. 8 of that station. At the Arizona station, the average gain per day for a steer was about .47 pound, while the best gain was .73 pound. The results from the two stations, being so nearly alike, point strongly to the conclusion stated before, that only a gain of from one-half to over one pound per day may be expected from the average feeding, while the poorest will run down as low as one-fourth pound per day, and the best about one and one-fourth pounds per day. Experiments at both stations would indicate that alfalfa alone is not a feed that will make very rapid gains. As to its feeding value compared with other hay, in a few short trials here we have found that, fed to steers with grain, or to sheep without grain, it proved to be better, pound for pound, than either timothy or wild hay, while red clover is found to be better. The general class of farmers here consider that alfalfa cut before bloom is an excellent food for sheep or milch cows; cut at bloom the best for beef, and cut when going out of bloom for horses. However, freighters and liverymen will not allow their horses to eat it at all, the liverymen going so far as to give instructions that a horse be given no hay for the noon meal, if kept away from the stable, rather than feed alfalfa.

As to the yield of this crop there is very little definite information. Along with the feeding value, we are attempting to get at the yield as nearly as possible. Besides this, we have made a test of yields by the small-plat method, both on good and on poor soils, for some years. Part of the following yields are from the college farm, part from ground rented from the county, and part from ground rented from three different farmers.

The following table gives the yields, in tons, per acre, as obtained from these different sources :

QUALITY OF LAND.	First crop.	Second crop.	Third crop.	Total.
College farm.....Poor, gravelly soil (average for four years).....tons	2.107	1.160	.....	3.267
County land.....Good soil (average for two years)....."	3.022	2.373	.....	5.395
Nyman's land.....Poor, gravelly soil (1893)....."	1.844	1.338	0.592	3.577
Burrows' land.....Good soil, with gravelly subsoil (1894)....."	2.096	1.546	1.623	4.725
Cronquist's land.....Good soil, with clay subsoil (1894)....."	.....	1.978	.....	.....
Average....."	2.267	1.679	1.107	4.241

The first two yields here given are from small plats, the second two are from five-acre plats, while the last one is from an irregular piece of ground containing about $1\frac{1}{4}$ acres, or exactly 1 acre and 115.88 rods. These yields represent about all of the different conditions of soils and managements of this section. It is my opinion that there are more extravagant statements made in regard to the yield of alfalfa than of any other crop. As will be seen, our best plats yielded but a little more than $5\frac{1}{2}$ tons per acre, while on our poorest soil the yield is only $3\frac{1}{2}$ tons. However, $3\frac{1}{2}$ tons of good hay from very poor soil, from an economical standpoint, is a very satisfactory yield, though it hardly reaches the expectations of the enthusiast. In this connection, it may be well to give the statements of the three men whose names appear in the last table.

Mr. Nyman says that his crop will average more than the yield recorded; that the year 1893 was a poor year; always thought he got five and six tons to the acre. The writer, however, is of the opinion that the ground from which the reported yield is taken never yields more than four tons per acre. Mr. Burrows says he knows he never gets more than $5\frac{1}{2}$ tons per acre, and generally counts on getting less. It is thought that we lost about a quarter of a ton per acre, for, as spoken of before, some of the cuttings did not cover the whole growing season. Mr. Cronquist says that the best plat he ever had, out at its prime in its best year, gave him six tons of baled hay to the acre. He thinks there are a great many more who get less than five tons than there are who get five or more tons to the acre.

The only other authentic yields available are reported by the Colorado and Wyoming stations—in each case the yield of but one piece. Fifty-five acres gave, at the Colorado station, a yield of a trifle over five tons per acre. (Colorado Sixth Annual Report, p. 65.) The Wyoming station reports a yield two years in succession of nearly eight tons per acre. (Wyoming Bulletin No. 16, p. 233.) This is the largest yield that has ever come to the writer's notice, and for that section of the country I should call it abnormal. To sum up these yields, then, I fully believe that four tons are above the average obtained, while $4\frac{1}{2}$ is moderately fair, with five tons a very good yield. There is, though, a possibility of reaching six tons or more.

If seed is to be the principal crop, then not more than 12 pounds per acre of seed should be sown. One crop cut early, before bloom, and a crop of seed, is generally conceded to be the most economical method of handling. For seed, it should not be cut until as many as possible of the seed pods have turned black, the cutting beginning only when the seed begins to shell. Here, the cutting is generally done with the old self-rake reapers. The operation consists of simply cutting and raking it off in medium-sized bunches; it is left until dry enough to stack or thrash, and then loaded direct from the bunches and hauled either to the stack or thrasher. The ordinary thrashing outfit is not at all satisfactory. Of these, however, the end-shake riddles give the best results, while for thrashing grain the end shake is considered a failure. The thrasher reported as giving the best satisfaction is an end

shake in which a duplicate set of riddles have been placed with the side-shake motion. In this the end-shake riddles clean out most of the hay and heavy chaff (which always clog the side shake) without the aid of much wind. The seed and light chaff then drop onto the side shake, where the wind is applied, the seed not being so readily blown over with the side-shake motion. The thrashing is generally paid for by tolling at the rate of six bushels per 100. The value of the straw from which the seed has been thrashed must be rather limited, in the light of the experiment given previously. Yet there are men who claim that it is more valuable, pound for pound, than the well-cured hay cut at an earlier stage. It is as a rule classed and sold at one-half the value of alfalfa hay. This, I believe, is about its value.

As a pasture for cattle and sheep, alfalfa is very risky, be the weather or climate wet or dry. Cattle may run on it for a long period, then suddenly bloat and die. In order to successfully pasture at all, cattle or sheep should be permitted on it for a half hour to an hour per day for a day or two; then the time gradually lengthened. After this the animals should never be taken off, neither night nor day. If for any reason an animal is taken off for a longer or shorter period, the same care must be exercised in putting it back on again. If an animal bloat at any time, it must be doctored at once and put on the pasture again. We have found the best treatment to be a dose of one pint of raw linseed oil and about two teaspoonfuls of turpentine, or, more accurately, 28 c.c. of the turpentine. After giving it, if relief is not immediate the dose should be repeated, unless the animal shows signs of great pain. If such be the case, the stomach must be punctured within a few minutes, and sometimes seconds, or death will ensue. Should the animal be found in great pain, the puncturing must be immediately resorted to. The puncturing is best done with a trocar, or common "bull punch." If these are not at hand, a knife can be used. The opening is best made at about four inches forward from the hip bone and the same distance below the loin. If the trocar be used, the cannula, or sheath, may be kept open by frequently introducing the trocar, or by other means; but it must be kept open, that the gas may readily escape. If the knife be used, the incision must be kept open by some means. As a very last resort, the incision may be made large enough so the hand may be introduced and the foaming contents of the stomach rapidly removed. Whatever is done must be done forthwith after the animal shows symptoms of violent pain.

As to its value as a pasture grass, there seems to be a difference of opinion. We have done some work here on this matter. For cattle, 10 half-acre plats of nine varieties of grass and a mixture are fenced off. In 1893, one steer was placed on each half acre and kept there all summer. In 1894, two steers were placed on each half acre, so that they were rapidly eaten off. This gives the all-summer value of each, and the early-summer value. The following table gives the results from seven of the half-acre plats:

KIND OF GRASS.	GAIN PER DAY PER STEER.		
	1893.	1894.	Average.
English rye grass.....lbs.	1.93	0.36	0.78
Orchard grass....."	1.86	0.62	1.24
Tall oat grass....."	1.82	1.64	1.73
Meadow fescue....."	2.08	0.42	1.25
Timothy....."	1.70	1.14	1.42
Lucern....."	1.57	1.22	1.39
Mixture....."	2.17	2.22	2.20

As will be seen, for an all-summer pasture, in 1893, alfalfa ranks the lowest of the seven grasses or mixture here given. As an early-summer pasture, in 1894, where quick growth is necessary, it ranks third in the list given. Of course, it will be understood that alfalfa is part of the mixture. This mixture, too, has proved itself worth nearly double any of the grasses or alfalfa singly. We are also making a study of the value of alfalfa mixed with grasses as a pasture for hogs, with a full ration of grain, with different part rations, and without grain. Along with this, we are carrying a system of feeding hogs in yards and in pens, in order to determine the value of exercise in connection with pasture. In the following table, the matter is put in concise form:

HOW FED.	GAIN PER PIG PER DAY.			
	1892. May 26 to Oct. 14.	1893. June 6 to Oct. 6.	1894. June 27 to Sept. 26.	Average.
Full ration of grain on pasture.....lbs.	1.08	1.14	1.65	1.29
Three-fourths ration of grain on pasture....."			1.23	1.23
One-half ration of grain on pasture....."			.85	.85
One-fourth ration of grain on pasture....."			.61	.61
On pasture, without grain....."		.35	.345	.347
In movable pen, with full ration of grain, on pasture....."		.83	1.15	.99
In yard, without grass, on grain....."		.90	1.48	1.19
In pen, without grass, on grain....."	.78		1.34	1.06

This table, I believe, represents very well the pasture value of alfalfa mixed with grass, and the different methods of pasturing, in comparison with hogs fed in yards and small pens without grass. Especial attention is called to the relation of the amount of grain fed and the relative gain in 1894. One-fourth of 1.65 is .41, in round numbers. Those on the one-half ration of grain gained .61 pound per day, as against this theoretical .41; those on the half ration gained .85 pound per day, as against the theoretical .82. Those on the three-fourths ration gained 1.23 pounds per day, as against the theoretical 1.23. From this it can be readily seen that the grass eaten was of no real value whatever unless fed a full ration of grain; it was wholly a loss. This is not quite true of those fed the one-fourth ration. Yet the worst system is the feeding in a movable pen, as the hogs fed this way did poorly for the grain consumed. On pasture, without grain, the results for the two years were so nearly identical that we feel like giving it as nearly a certainty that hogs treated in this way will gain about one-third of a pound per day. Though this is a slow growth, it is, nevertheless, a definite growth that can be counted on, and the reader may make his own calculation. It will be noticed that those in the yards without grass did nearly as well as those on pasture with a full ration of grain.

Alfalfa is well adapted to soiling, for, if just enough ground be used, it is possible to cut it over and over and always have the grass in the stage of growth desired. There is little danger of bloating when used in this manner. We have made some experiments in soiling steers and hogs. With pigs, the idea was to study its value with a full ration of grain, with a part ration, and without grain. The results are given in the following table:

HOW FED.	GAIN PER PIG PER DAY.			
	1892. May 26 to Oct. 14.	1893. June 6 to Oct. 6.	1894. June 27 to Sept. 26.	Average.
Full ration of grain without alfalfa (in pen).....lbs.	.78	.....	1.34	1.06
Full ration of grain with alfalfa (in pen).....	.77	.....	1.44	1.10
One-fourth ration of grain with alfalfa (in pen).....	.....	.....	.35	.35
Alfalfa without grain (in pen).....	.....	.....	— .26	— .26
Full ration of grain without alfalfa (in yard).....	.....	.90	1.48	1.19
Full ration of grain with alfalfa (in yard).....	1.00	1.05	1.31	1.12
Full ration of grain on pasture.....	1.08	1.14	1.65	1.29

As will be seen, pigs fed alone on alfalfa, in pens, gave a loss of a little more than one-fourth pound per day, for 91 days. Those fed on the one-fourth ration of grain simply gained one-fourth as much as those on the full-grain ration, while, with those in the pens and yards, the alfalfa was simply lost, to all outside appearances. Yet this much may be said, that the hogs receiving the alfalfa did not fatten down so rapidly as those on grain alone, and could be carried with profit much longer.

Soiling with hogs proved a failure and a disappointment. With steers, three sets were used. One set was pastured, one set soiled, and the third set fed dry hay from an adjoining plat. The grass for the last set was cut every day, as was the soiling grass, and spread out to dry. The growth per day for 92 days was as follows: Those pastured, 1.46 pounds; those soiled, 1.45 pounds; those fed the dry food, 1.45 pounds. But those that were pastured required 28.2 per cent. more ground than those soiled. This would seem to show that there is a saving of over one-fourth by soiling in place of pasturing, but that the alfalfa may as well have been cut and fed dry, thus saving the carrying of nearly 80 pounds of water to the barn in every 100 pounds of feed. Timothy was used during this trial for a short period.

The alfalfa is a perennial. On porous or gravelly soil well suited to its growth, it often yields well for 10 or 15 years. It has been known to live for 20 and 30 years; but on the best of soils it declines rapidly after 10 or 11 years, and reaches its maximum production at about the fifth or sixth year. On damp soil or ground, with a hardpan subsoil, its life is very short. Very often on such ground, with a rich soil, it will do exceedingly well for a short time, reaching its maximum production the third year, then rapidly declining. On such ground it should be plowed up after the fourth year. It is doubtful whether, under the most favorable conditions it is well to allow it to stand more than 10 years.

As a green manure or a soil renovator, alfalfa is hardly equaled by any other plant. It is very rich in nitrogen, and gets a goodly portion of its nitrogen from the air, leaving much of this in the soil by means of its large roots. Aside from this, when used as a green manure, there is a great deal of humus added to the soil, both by the matter turned under and by the roots. The large, long roots open the subsoil to a great depth, serving much the same purpose as does the subsoil plow. It has great manurial and mechanical value. For the purpose of green manuring, or for use in a rotation, there is one great drawback. In ground where it thrives well it is nearly an impossibility to rid the land of the crop. There are few plows made strong enough to do the work, and it is a heavy load for six oxen. However, after the crop begins to show signs of failing the plowing is much easier.

There has been much written of alfalfa, most of which reads like fairy tales, but, from the few facts that I have been able to gather, it is seen that six tons per acre is a large yield, while from four to five tons is about what is obtained. As to its feeding value, it would appear that it does not come up to other good hays, though

from a few limited experiments here we found that when fed with grain it proved to be better, pound for pound, than timothy or wild hay. On the open market here, it brings less than any other hay grown, or 25 to 50 per cent. less than any other tame hays.

As a pasture, on poor soil, where alfalfa is supposed to have the greatest advantage over the grasses, we found six grasses that gave better returns during the whole summer of 1893. As a pasture for hogs, it did fairly well mixed with grasses. As a soiling crop for hogs, it has little value. For steers, it was some better for soiling than timothy. Doctor Vassey says, in his report for 1889 (page 85): "Although alfalfa improves the fertility of the soil, it must have a rich soil to start with, and it therefore is of little value as a renovator of worn-out land." This, in this section at least, is a mistake. Never have I seen land so poor but that the alfalfa would start, although it will do better, the same as will clover, on rich soil. In this connection, it may be well to quote from Atwater and Woods. In their nitrogen experiments, they say: "We have found but little difficulty in growing alfalfa in sand; even plants not fed with nitrogen, but supplied with plenty of mineral food, have developed normally, and have at no time shown any very marked starvation stage of growth." (Second Annual Report of the Storrs School of Agriculture Experiment Station, page 23.)

Two experiments are given which show that the plants did much better when fed nitrogen. The writer had some opportunity for observing the growth of alfalfa in Kansas, mostly in the vicinity of Manhattan. Also, however, to some extent over a much greater portion of the state, both south from Manhattan and west and northwest along the Union Pacific and the Chicago, Burlington & Quincy railroads. As compared with alfalfa in Colorado, Wyoming, and Utah, it would impress one as being next to a failure as a suitable stock food, the growth being so much more coarse and stalky. This, too, on a soil where the red clover and several grasses attain seemingly perfect development. I feel perfectly safe in predicting that, where the red clover makes such growth as it does in central and eastern Kansas, alfalfa will never replace it. As for western Kansas, it is advocated that on account of lack of moisture clover is a failure, and that alfalfa would likely prove a success there and a boon.

Observation here has shown that, in order to make a crop, alfalfa needs nearly as much water as does clover. Though the roots go deep, and probably lift water from below, this water is not furnished rapidly enough to supply the rank-growing alfalfa. The only real advantage derived from the long roots seems to be that enough water is thereby supplied to keep the plants from perishing during seasons of dry weather. Then, as soon as sufficient moisture is furnished, the alfalfa shoots forward, where the other clovers would be partly or wholly killed out. For this reason, and owing to the fact that in Colorado it is so successfully grown, it may succeed without water, to some extent, in western Kansas; yet, as a rule, the conditions there are just the reverse to those essential to successful growth. While it would be well to proceed with caution in western Kansas, it would seem that there is everything to gain and nothing but the seed and time to lose by making a trial of alfalfa.

ALFALFA ON KANSAS UPLAND, WITHOUT IRRIGATION.

By H. R. HILTON, Topeka, Kas.

The alfalfa plant is not limited in its choice of soils to one or two special varieties. It is at home in any moist soil, whether light sand, dark loam, or any variation of either or both, regardless of location. It loves best an open, friable subsoil, where its roots can readily penetrate and range to great depths in search of water.

Hence its greatest productiveness in sandy valley lands, and lesser returns where subsoil is hard or compact.

It is a plant that responds readily to a bountiful supply of water; at the same time, there are few plants that can maintain their existence on so limited a water supply. But, in order to secure satisfactory returns, the alfalfa plant must have some moisture, not only in the surface soil, but also continuously for several feet into the subsoil.

The valley lands, by reason of their nearness to permanent water supply and greater moisture content, usually offer the most favorable conditions for growth of alfalfa; but there are also many upland soils in Kansas which can, by special preparation, be made to produce it successfully, at least more certainly than any other crop that can be grown. Alfalfa is a deep rooter, and to this fact is probably due its great power to resist adverse conditions. This habit of the plant must be recognized and provided for in the preparation of the soil for seeding. Any upland soil, whether sandy or loam, capable of maintaining a moist subsoil at all times, can be so prepared as to successfully grow alfalfa. Where the subsoil is dry from near the surface to the level of the ground water which supplies the wells, as in many parts of western Kansas, the difficulties become greater, but with special treatment there are many soils that will so conserve the moisture as to make alfalfa the most profitable crop to grow.

Thorough preparation of upland soil is imperative. On sandy soil, which takes in all the rain that falls, it may be grown on sod, or, if old cultivated ground, after a good plowing and thorough harrowing, but as a rule sandy soil cannot maintain a percentage of moisture high enough to insure profitable growth, outside of river valleys, west of the central counties. The plan outlined in the following is intended for that much larger area of upland soil, common to central and western Kansas, which has just enough sand to distribute the water freely through it, and sufficient silt and organic matter to hold back a good percentage from drainage. The soil is rich in all the elements of fertility and the surface works up mellow and loamy. The subsoil is oftentimes compact or hard, into which water finds its way slowly—oftentimes too slowly to save all of the water supplied by many of our thunder-showers.

For such soils the following is suggested: Use only land that has been in cultivation for several years. Plow as early in summer or fall as feasible, following the surface plow throwing a four-inch furrow with a subsoil plow that will loosen the ground underneath 10 to 15 inches deeper. Follow this plowing with float, and, after every good, soaking rain, give it a light harrowing. If prepared early in summer, and good rains come before October to soak it as deep as plowed, then it may be seeded to fall wheat; but if only light rains fall after subsoiling, then save the ground for a spring crop the following season. Give the land surface cultivation only during this second season. After crop is removed, harrow with disc or spring tooth two or three inches deep. When this is dried out, let a heavy roller be passed over it, following the roller immediately with the plow. If windy, roll only a few rounds at a time in advance of the plow. Plow deep—seven to nine inches—turning the fine, dusty soil prepared by roller into the bottom of the furrow. Level promptly with float, and mulch by giving the ground a light harrowing. The fine soil turned under holds the highest percentage of moisture.

It is important that the rainfall get into the soil, and this fine soil helps to pull it down and hold it below the surface. The next important thing is to save it. If the falling rain hardens or compacts the surface, it should be loosened at once, to form a mulch and prevent waste, but this must be done promptly, while there is some moisture in the surface soil, to prevent its pulverizing too much and being

blown away. If this preparation follow wheat or oats, and ground has had sufficient rain, the alfalfa may be seeded early in September of this year, being about one year from date of subsoiling; but if ground is still dry, then defer the seeding till rains have well moistened the soil through and below the soil loosened by the subsoil plow, which will usually occur during the winter or following spring months. Seeding with press drill will probably give best results in most localities, but use whatever plan has given best results on similar soils in the vicinity.

When a good stand has been secured a good work has been done. When a good stand has been maintained for several years a better work has been done. Heavy showers tend to harden most soils. Hard surfaces encourage rapid evaporation. Every time a crop of alfalfa hay is cut, if surface has compacted, run the harrow over the field to loosen the surface again. The harrow cannot injure the alfalfa plant, and the effect of harrowing is to mulch the exposed surface and save moisture, till the plant gets sufficient growth to shade the ground again. This should be repeated after every cutting. The clover field should be visited while heavy showers are falling, to see if the soil takes in all the rain as fast as it falls. If any runs off, then the soil needs to be harrowed deeper, at the first opportunity, so that all the rainfall be retained for service.

With thorough preparation before seeding, and good care after a stand is secured, alfalfa should be a profitable crop, in most of the seasons, as far west as the 99th meridian; and, if the plan outlined is strictly adhered to, soils capable of retaining a high percentage of moisture after rainfall, in any part of western Kansas, can, by judicious handling and guarding well against excessive evaporation, be made to give better returns from it than from any other crop now cultivated there and not irrigated.

ALFALFA AND PERMANENT MOISTURE.

Mr. W. E. Crutcher, of Beaver City, Furnas county, Nebraska, (a region 12 to 20 miles north of the north line of Norton county, Kansas, and lying between the Republican river and Sappa creek,) writes as follows to the *Iowa Homestead*, in relation to the necessity of permanent moisture within reach of alfalfa roots as a requisite for its successful growth:

"Some time last spring I wrote you concerning the nature of alfalfa, differing from your expressed opinion that the roots of the plant, in order to grow vigorously, must reach permanent moisture. I fear that the facts I then stated did not change your opinion. At the close of the driest season in the experience of this country since its settlement, I have a few more facts to offer: (1) There is no permanent moisture in the soil here until you reach the sheet water, which is the unfailing supply for all our wells. (2) This sheet water is from 6 to 12 feet below the surface in the bottom lands, and 30 to 175 feet below on the prairie lands. As a witness of these two facts, I refer to Mr. John F. Modlin, of this town, who has bored many wells in both low and upland, and states that no evidence of moisture whatever can be detected from a few feet below the surface till the moist earth a few feet above the sheet water is reached. (3) Alfalfa has done well in this county in this dry year, even upon upland in places where it is over 100 feet from surface to sheet water; has made splendid pasture for hogs and cattle, and, when not pastured, has made good hay—not such a heavy crop as usual, but at least two tons per acre.

"In verification of this latter statement, I refer to Mr. Wm. S. Campbell, of Wil-

sonville, this county, and could name many others, if necessary. Mr. Campbell's farm is 130 feet above sheet water. Of course, alfalfa does better upon bottom lands where the roots can reach permanent moisture—that is, hay crop is larger, but usually not of so good a quality—but it is undoubtedly a grand success, even upon the high prairie. A conservative farmer told me the other day that his alfalfa crop this year would likely net him \$60 per acre clear profit. He has table-land from 30 to 40 feet to sheet water. Hay now retails at \$14 per ton, and the seed usually brings \$5 or \$6 per bushel. The custom is to cut two crops of hay and save the third crop of the season for seed. It yields this year 6 to 10 bushels per acre. Seed does better dry years, while the hay is heavier wet years. On favorable land, an average year, one ought to get at least four tons of hay and five bushels of seed per year.

“To me, the logical deduction from the above-named facts is, that alfalfa is a plant that is adapted to this soil and climate, and rejoices most in a rich, moist soil, but can be profitably grown upon any of the lands in this part of the country, and is, all things considered, the most wonderful forage plant of which I have any knowledge.

“I recall an editorial which appeared in your paper stating that the agricultural part of the public domain is exhausted, and that free homes can never again be offered to the home seeker. This is doubtless true, and yet it is no cause for present sorrow. As population increases better methods of farming are introduced, new discoveries are made as to the most profitable crops for different localities, and it seems that as our needs increase providence supplies the means to meet them. Alfalfa is comparatively a new plant to this state, and is a source of profit and constant wonder even to its most enthusiastic friends. A prosperous farmer told me a short time ago, that at the present price of corn he can, by using alfalfa pasture, make every bushel of corn fed to his hogs bring him \$1.

“In conclusion, I would say that there are a number of plants which endure the driest season and continue to grow through it all. Cactus flourishes in the driest years; alfalfa does well in the same.”

The editor says: “If our correspondent means by permanent moisture, moisture of the kind that supplies wells, there are numerous instances which bear him out in what he says. A correspondent at Elm Grove, Mo., in a communication recently published in these columns, writes: ‘Your claim that the roots extend down to permanent water supply is true in general, I think, though there may be exceptions. I have one piece close by and nearly on a level with where a well was sunk 100 feet without finding water, and another piece where it is 75 feet to water.’

“This,” continues the editor, “coincides with the idea expressed by Mr. Crutcher, but water for wells and water for feeding the roots of plants are, perhaps, two different things; actual veins or sheet water are necessary for the former, while capillary attraction, if there be no intervening hardpan, may abundantly supply the latter. It is difficult to suppose that alfalfa forms any exception to the general rule, that it takes about 300 pounds of water, on an average, for each pound of dry matter made by vegetation. It seems quite certain, however, that it is not necessary for roots of alfalfa to penetrate to a point at which a well could be obtained. For while instances are numerous where the roots have penetrated 30 feet, there are none, so far as we know, where they have extended for 75 or 100. We quite agree with our correspondent, that alfalfa is a plant that is well adapted to the soil and climate of his locality, and that it is a great boon to it.

“We recall the editorial to which reference is made, relating to the exhaustion of the public domain, and the consequent necessity for abandoning the policy of giving free homes to all who want them. Uncle Sam is no longer rich enough to give

us all a farm, and yet the fact is, as our correspondent suggests, there is no cause for present anxiety. Better methods, better adaptation of crops to localities, and a host of improvements perhaps as yet undreamed of, will for many, many years prevent any serious pressure of population upon the means of subsistence. And then the back is always fitted somehow to the burden—as needs increase the means to supply them increase, and the exhaustion of areas to be given away is no ground for taking a pessimistic view of things. Indeed, it is questionable whether people are much profited by being given things, and whether they do not make a wasteful and improvident use of them when they come easy. There is yet a large domain to be reduced to cultivation, but it will have to be conquered by irrigation; it is not of the kind that will yield a harvest for the mere tickling of a hoe.”

A COMPARISON OF YIELDS.

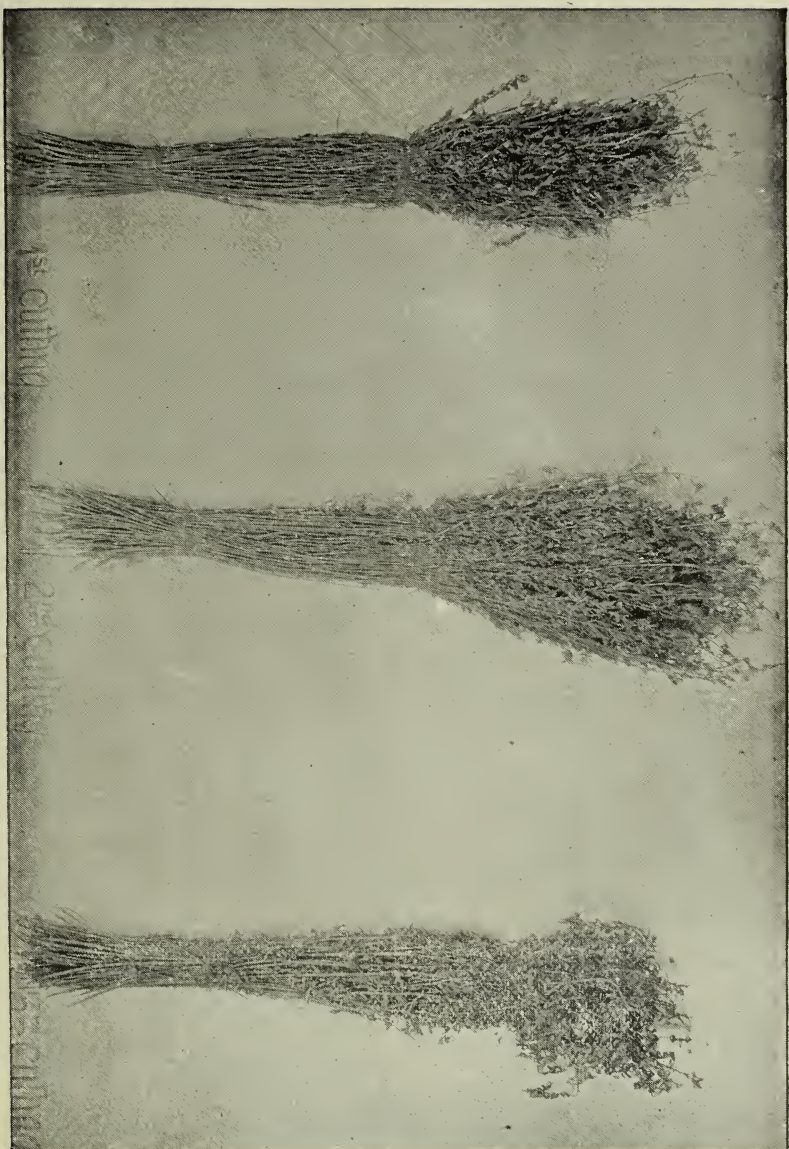
In 1892, Professor Ingersoll, at the Nebraska agricultural station, at Lincoln, planted a number of forage plants, such as the clovers, including alfalfa, and several of the tame grasses. The alfalfa, he says, in spite of the dry spring, grew finely, and in the fall, during the prolonged and severe dry period, it was the only green plant of the whole list. No fertilizers were used on any of the plats; the ground was simply plowed, harrowed until very smooth, and after sowing was all lightly harrowed and smoothed with a plank drag. During the first season the plats were mowed once, and the weeds and surplus grass raked off. The following table shows the yield of each variety in the next year, 1893:

Plat No.	VARIETY GROWN.	Hay, 1893.	Yield per acre.
1....	June clover..... lbs.	473	2,365
2....	Mammoth clover.....	475	2,375
3....	Alsike clover.....	413	2,065
4....	Alfalfa (first cut).....	816	4,080
5....	Blue grass.....	575	2,875
6....	Orchard grass.....	478	2,390
7....	Timothy grass.....	560	2,800
8....	Redtop grass.....	470	2,350
9....	Meadow fescue.....	375	1,875
10....	Tall meadow oat grass.....	600	3,000
11....	Italian rye grass.....	.....	.....
12....	Timothy, blue grass, orchard grass.....	203	1,015

Professor Ingersoll calls attention to the great difference in the yield of forage (cured hay) per acre, in the last column, varying from 1,015 pounds to 4,080 pounds, the latter being for alfalfa, while the former was the plat of mixed grasses. He further says:

“In justice to plat 12, we will say, however, that this was located too near a row of well-grown cottonwood trees, and thus, to some extent, they were robbed of plant food and moisture. But the comparison does not end here. The alfalfa plat kept on growing, by means of its deep roots, and, when in blossom, was cut twice more. The other plats made no aftergrowth worth mentioning. The alfalfa crop then stood as follows for 1893:

	Hay, lbs.
First cutting.....	816
Second cutting.....	805
Third cutting.....	743
Fourth growth (estimated).....	180
Total.....	2,544



June 29—26 inches.

August 2—26 inches.

September 1—24 inches.

Alfalfa-Growth in 1898, at Nebraska Experiment Station, showing the season's three different cuttings.

"This, being for one-fifth of an acre, gives, as the total production per acre, 12,720 pounds, or, approximately, $6\frac{1}{2}$ tons of good, dry forage. What plant do we grow that, without special care, will give greater, or even an equal return of good, palatable forage? Some sorghums may give the number of pounds, possibly, though we doubt it, but they are, comparatively, a very poor food."

FEEDING VALUE OF ALFALFA HAY.

"The philosophers have been inquiring into the secrets of the alfalfa plant, and have found that the hay is, in money value, 45 per cent. better than clover and 60 per cent. better than timothy. This," writes the editor of the *Field and Farm*, "carries out our long-expressed theory that alfalfa is the greatest all-round forage plant the world has ever known. We desire, in this connection, to draw a few well-timed conclusions. To secure a good milk ration by the use of timothy hay, protein must be supplied from some other source, in order to secure a ration that will give a sufficient amount of that material without entailing a loss of carbohydrates and fat; clover hay, however, is a fairly good ration in itself, and can be economically used without the addition of any other compounds; alfalfa hay, on the other hand, requires the addition of large amounts of both fat and carbohydrates in order to be profitably utilized as a milk ration.

"This fact renders alfalfa even more serviceable than its valuation would indicate, since, in the management of farms either for dairy purposes or for grain farming, an excess of carbohydrates is secured, which in the great majority of cases is wasted, either through lack of proper material from other sources with which to balance the ration, or through ignorance of the real loss incurred. Under ordinary conditions, $2\frac{1}{2}$ pounds of protein, four-tenths of a pound of fat and $12\frac{1}{2}$ pounds of carbohydrates can be profitably fed daily to a milch cow of 1,000 pounds live weight. One ton of alfalfa hay, containing 35.3 pounds of digestible fat, 280.1 pounds of digestible protein, and 770.7 pounds of digestible carbohydrates, would furnish sufficient protein for 112 days, fat for 88 days, and carbohydrates for 61 days.

"Therefore, in order to feed this amount of alfalfa economically and profitably, fat sufficient for 24 days and carbohydrates for 51 days must be added from some other source. In securing these amounts of fat and carbohydrates, it is impossible to avoid adding protein to a slight extent, since all farm products that are of any value for feeding purposes contain more or less protein; this addition of protein, however, may be, and should be, reduced to a minimum by the selection of those materials which contain it in the smallest amounts. Among these may be mentioned field cornstalks, green fodder corn or ensilage, wheat straw, oat straw, root crops, etc. One ton of field cornstalks, containing 17 pounds of fat, 60 pounds of protein, and 1,076.6 pounds of carbohydrates, would furnish sufficient protein for 24 days, fat for 40 days, and carbohydrates for 86 days.

"Two tons of a mixture of equal weights of field cornstalks and alfalfa would therefore furnish food sufficient for 136 days without noticeable loss of any of the digestible compounds. In the case of corn ensilage, every ton of which contains six pounds of fat, 24.4 pounds of protein, and 296.6 pounds of carbohydrates, three tons would furnish sufficient protein for 28 days, fat for 45 days, and carbohydrates for 71 days. Four tons of a mixture composed of one ton of alfalfa hay and three tons of ensilage, or green fodder corn, would therefore furnish food sufficient for 136 days without any appreciable loss. Alfalfa, therefore, furnishes the farmer a feeding material, rich in protein, which can be substituted for such waste products as wheat,

bran, cotton-seed meal, etc., usually bought in order to profitably utilize the excess of carbohydrates.

"There is no way in which more net profit may be secured from an acre of good alfalfa than by pasturing young hogs upon it. One acre should sustain 10 to 15 hogs from spring to fall. If they weigh 100 pounds each when put on the alfalfa, they should be able to make another hundred each from it during the season. Ten hundred pounds at 5 cents is \$50, and there is no expense to be deducted. Six hundred pounds of pork from an acre of corn would be a good yield, and then the expense of cultivating and harvesting and feeding would make a big hole in the net profit. Pork making from alfalfa is one good road to success."

ALFALFA *versus* CORN.

By Prof. W. W. COOKE, Colorado Agricultural Experiment Station, Ft. Collins.

Throughout the northern half of the Mississippi valley corn is the great crop. It produces more feeding material per acre than anything else that can be grown. In Colorado it meets a worthy rival in alfalfa. Both these crops were grown side by side, in acre plats, on the station farm in 1893. The land was in good condition, and in addition a very heavy application of stable manure was given to the corn ground, so as to show it at its best. Colorado is not so well adapted to corn culture as are Kansas and Nebraska, owing to the cool nights that result from its high altitude and the near presence of the mountains. But the crop of corn to be described would compare well with crops of the Eastern and Middle states, being equivalent to one of their crops of 14 tons of green fodder per acre. It is also fully up to the average of the great corn states of Kansas, Nebraska, and Iowa.

The variety was the Golden Beauty, planted May 18, in hills three feet apart each way, harrowed two times, cultivated four times, and irrigated once. It was harvested September 21, and the entire crop, ears and stalks, weighed 15,500 pounds per acre. The analysis showed 35.62 per cent. of dry matter, so that the crop contained 5,539 pounds of dry matter per acre.

The alfalfa on a neighboring plat was not fertilized, and was three years from seeding. It was irrigated twice and cut three times, yielding, at the first cutting, 4,600 pounds of hay per acre; at the second, 3,350 pounds, and, at the third, 3,250 pounds, a total of 5.6 tons of hay, containing 10,304 pounds of dry matter per acre.

The alfalfa therefore yielded almost twice as much dry matter per acre as the corn. But this is not quite a fair comparison, for a pound of dry matter from the corn crop is more digestible and has a higher feeding value than an equal amount from the alfalfa. The corn contained 3,605 pounds of digestible feeding material, while the alfalfa contained 5,611 pounds, or a little more than half as much again. The corn crop per acre, in feeding value, was equivalent to 3½ tons of alfalfa hay.

YIELD PER ACRE OF CORN AND ALFALFA.

FEEDING VALUES.	TOTAL.		DIGESTIBLE.	
	Corn.	Alfalfa.	Corn.	Alfalfa.
Dry matter.....lbs.	5,539	10,304	3,605	5,611
Albuminoids....."	405	1,602	296	1,198
Starch, sugar, etc....."	3,263	4,782	2,186	3,114
Fiber....."	1,472	2,800	1,060	1,198
Fat....."	84	246	63	101
Ash....."	315	829		

There is no doubt but that it costs much more to grow and harvest the corn than the alfalfa. Moreover, while the corn crop rapidly exhausts the soil, the alfalfa sends its roots deep into the soil, and gathers stores of plant food from the air, so that it seems, for the present at least, to benefit rather than deplete the land.

The leaves of alfalfa hay fall off very readily from the stems. A little pounding was sufficient to separate a quantity of the hay into two equal parts, one of which was mostly leaves with a few short stems, and the other mostly stems. Samples of each gave analysis as follows for the dry matter:

	<i>Leaves.</i>	<i>Stems.</i>
Ash.....	12.36	7.05
Crude fiber.....	25.68	42.47
Fat (ether extract).....	3.46	2.95
Albuminoids.....	13.12	8.61
Starch, sugar, etc.....	45.38	38.92

DIGESTIBLE PORTIONS OF DRY MATTER.

	<i>Leaves.</i>	<i>Stems.</i>
Crude fiber.....	11.64	18.36
Fat (ether extract).....	1.38	1.15
Albuminoids.....	9.84	6.46
Starch, sugar, etc.....	29.49	25.30
Total digestible material in 100 lbs..	51.75	51.27
Nutritive ratio.....	1:4.5	1:7.2

It will be seen, says Professor Cooke, that the two are about equally digestible. But they are quite different in the proportions of their digestible parts. The stems are properly proportioned for horses at moderate work, while the leaves are well adapted to the needs of growing calves and yearlings.

ALFALFA FOR HOG RAISING.

By R. E. VAN HUSS, Finney county, Kansas.

I believe the hog industry here can be made one of the most profitable we have, if properly managed, and will give my experience: I came here seven years ago, bringing with me three small pigs. I sold two of these and kept the other. The first pig I ever sold of my own raising here I traded for one bushel of alfalfa seed, which at that time was valued at \$7 per bushel, hogs being about the same price per 100 pounds. I sowed the alfalfa seed in the spring of 1888, and in the spring of 1889 I fenced one acre hog tight and turned in 10 head of hogs. They did very well on this one acre. The next year I pastured between 30 and 40 hogs on this one acre. The result, as you readily can see, was that the hogs did not have very good grazing that season. The next spring (1891) I increased my pasture to five acres and turned in 60 hogs, big and little. I also pastured my work horses and milch cows on the same piece of alfalfa, and the result was as before—rather close picking. The spring of 1892 I increased the alfalfa pasture to 20 acres. I have been out of luck since that time in not having hogs enough to eat it off. During the past season, a very dry one, I pastured 60 hogs, 15 horses, and three milch cows. The horses and cows were on the pasture probably two-thirds of the season. I also mowed the pasture twice during the season for hay. I am of the opinion that hogs will do better on alfalfa when it is nearly ready for making hay. The very young plant seems too washy. Hogs, however, seem to eat it with more avidity when young and tender.

My experience with hogs and alfalfa, as you observe, covers a period of five years, during which time the price of hogs has varied much, but I am safe in saying that my cash receipts will average \$300 per year for the time stated. Some years it would not reach that amount, but in other years it was considerable more. I

shipped a pig last summer, raised on alfalfa and fed corn eight weeks, that tipped the scales at 600 pounds. I have fattened out several bunches of hogs and made good profit; but I do not think this the most profitable way for southwestern Kansas farmers. I think the most money for us will be to sell stock hogs at six months old. These we can raise on alfalfa without any grain whatever, and can therefore produce them ready for the cattle feeders in the corn districts east of us cheaper than they can be produced even in the corn districts. One or two farmers may not be able to do this, but if all our alfalfa farmers, or a large number of them, will give up part of their acreage to raising stock hogs, cattle feeders will soon come right to our doors and buy them.

We can also take our brood sows through the winters cheaper than eastern farmers can, for the reason that we can almost winter them on alfalfa hay and sorghum. If those inclined to doubt this statement will go to the Scott & March ranch, 14 miles northeast of Garden City, they will find about 60 hogs in as good condition as any farmer would desire stock hogs to be, and they are being wintered on alfalfa hay and cane.

Much has been said during the last three years about the profits of the alfalfa seed crop. I have been in both the alfalfa seed and the hog business, and, if I had to give up either, I would say let the seed business go and give me the hogs for profit-making.

[Upon the same topic MR. C. E. MAGRAW, of La Plata, San Juan county, N. M., writes to this department as follows:—*SEC.*]

"I came from Illinois to this county over nine years ago, and, having been something of a hog raiser in that state, I naturally soon began experimenting with hogs here. I early found that, being located at a tolerably high altitude, and also often short of water for irrigation purposes in the latter part of the season, that corn could not be depended on with any degree of certainty. Another obstacle in the way was that all classes of grain were too high priced to admit of being fed to hogs with profit. Accordingly I set to work to find some cheaper means of producing pork, and after several unprofitable experiments I have finally come to understand the subject so that I believe I can raise hogs profitably in this country without any corn and with but very little other grain.

"Of course, conditions will vary in different localities; in this section where we irrigate, and our climate and soil are perfection for alfalfa, an acre of alfalfa will produce, if perfectly watered and cared for during the season, from six to eight tons of cured hay. On such ground, two acres of land well set in alfalfa would be a model pasture; this should be fenced in four separate lots and a sufficient number of hogs be put on to graze one of these lots down close each week. At first in this way they would go over the entire four lots once each month; here we would irrigate the first two lots as soon as the hogs were turned off, so the alfalfa would have a good start and the top of the ground be well dried before the porkers got back to them again. If the ground is wet or muddy they can hardly resist the temptation to root, regardless of rings in the nose. If the swine are fall pigs that are roughed through the winter and weigh from 60 to 80 pounds when turned on the pasture in the spring, the above-described pasture will keep 25 or 30 head, and they will grow very fast and keep in good flesh without grain of any kind.

"By the first of August, they will have made large frames and look well, but their flesh will be soft and they will not weigh heavy. At this time, I usually have two or three acres of squashes which are beginning to ripen; those we gather, together with refuse fruit, small potatoes, melons, etc., and cook in a large vat, with a very little wheat or barley; then the whole is put in another large vat, or in barrels,

and let stand until it ferments, and it is then fed to the hogs. I use this for 30 days, or longer, if we have enough of it, and can almost see the hogs grow. Lastly, for almost two weeks, I feed grain straight, to harden the flesh, and we have porkers weighing from 200 to 250 pounds, ready for the market. This is my favorite method in this country, as I find that I can produce more pork on less grain, by having pigs come in October and November, than any other time, for our winters are mild, and as we have no crop that the pigs will injure during winter, we let them run at large, and they pick up the alfalfa leaves that shatter from the hay in feeding the other stock; with what waste they pick up, they need but a very small allowance of grain during the first winter; in fact, when we have plenty of potatoes, as we usually do, I cook them, and do not need any grain; then, fattening time coming on at a season when there is an abundance of inexpensive vegetables, such as squash, potatoes, sugar beets, wurzels, etc., we put on the fat with cheap feed, and harden it ready for market with grain. If sows and small pigs are turned on alfalfa in spring, they should have a little grain, or, better, they should be liberally slopped on bran and shorts, soured. Young pigs will thrive and do well on alfalfa, if they have some grain or grain slop; but, if allowed to run on the alfalfa without anything else, they grow too much to stomach."

HARVESTING ALFALFA HAY.

From Field and Farm, Denver.

"In harvesting alfalfa, it should be the aim to prevent undue exposure to sunlight and rain. It may seem strange to claim that we should try to protect hay from the influences of sunlight, when it is so much welcomed by all farmers while the process of curing is going on. But it is quite possible to have too much of a good thing. Unfortunately, it is the practice with many to cut hay with the mower, and then leave it lying on the ground until it is dry enough to rake into windrows for immediate removal to the stack. When thus cured, the feeding value of the hay is much impaired. In the first place, it has become unduly bleached and faded by exposure to the sunlight. The leaves have been crisped, so that their feeding value is considerably lessened, and many of them have fallen off. The stalks will also have lost weight unduly, also feeding value, and, moreover, they will have become much less palatable than they would otherwise be had the hay been cured according to the most-approved method. When alfalfa is first cut, it should, of course, lie long enough in the sunlight to dry sufficiently to admit of its being readily drawn together with a rake. As soon as it will rake easily it should be thrown into windrows. When it rakes quite heavily, and some difficulty attends the dumping while raking, it is then too green to rake. To facilitate the process of curing, a free use should be made of the tedder. This is a most valuable aid in haymaking, as all farmers will know very well who have ever used one, more especially one of the most-approved make.

"This implement tosses the hay into the air. When it falls down again it lies upon the earth topsy-turvy fashion, insomuch that every passing breeze blows through the hay as it lies on the ground and extracts moisture from it without producing discoloration. The wind may thus be made to dry the alfalfa more rapidly than the sunlight, and the two combined may thus be made to dry it very quickly. Were it not tossed into the air, it would lie so close to the ground that the wind would render but little service by way of curing. The extent to which the tedder should be used will vary much with conditions.

"It may usually be an advantage to drive the tedder over several times, more es-

pecially when the alfalfa has been cut at an early stage, and when it has been succulent and of vigorous growth. After a rain, which has fallen on the hay while yet unraked, the tedder may be introduced with much advantage to facilitate the drying process. And when the hay has been drawn into light windrows, the tedder may sometimes be driven along the windrows to still further expedite the drying process. The tedder should not be used, however, until the hay has lost some of its weight after cutting; otherwise it would fall flat on the ground again, and in consequence would not be benefited much by the tedding. Nor should it be used too quickly after rain. On the other hand, its use should not be too long deferred, for then, in addition to the loss of labor in using it, there would also be loss from the breaking off of the leaves of the hay. A hay tedder is invaluable to him who has much alfalfa hay."

In another article the same journal says:

"No feature of haymaking is more important than the time for cutting, and none, perhaps, is more neglected. In a majority of instances, alfalfa is allowed to get too nearly ripe before it is cut. The loss from handling it is thus very considerable. There is a loss in feeding value, a mechanical loss through the shedding of leaves and breaking heads in curing, in palatability, which causes a portion of the food to be rejected by animals. When these losses are linked with other losses in curing, the aggregate loss every year is very great. The ambition with many seems to be the harvesting of many tons of hay from year to year, regardless of its feeding value. They fail to consider that one ton of hay, cut at the proper stage and cured in the proper way, may be made to render more service than two tons cut when overripe and further spoiled in the harvesting. Quality in hay is no less important than quality in other things. If we wait until the crop has been matured, we lose so much in other ways that it has been found good practice to fix upon a mean between the two extremes as to proper time for cutting, and that mean is found in all grasses and alfalfa when they have reached the time of early blossoming. The aim, therefore, should be to cut hay as nearly as possible at the time when the bloom first appears freely; that is, when full bloom has been nearly or altogether reached. This cannot always be done when a large acreage is to be harvested; but it is good policy to commence to cut early, as the loss would be less if a portion is cut early than if an equal portion had been cut too late. In other words, the relative loss from cutting overearly would be less than from cutting overlate. The mechanical loss through the shedding of alfalfa leaves is very considerable. With alfalfa, the loss is greater even than with red clover.

"The loss in palatability is also a serious matter. Fodder cannot be turned into flesh if left uneaten. It may be possessed of considerable food value if viewed from the standpoint of the chemist, but that will not avail if it is eaten only under the impelling pressure of hunger. The chemist will give rye straw considerable feeding value, and yet it is practically worthless as a fodder, since live stock eat only when compelled to do so by hunger, owing to its woody nature. It is greatly important, then, to harvest hay in such a fashion that it will possess palatability. When alfalfa is very heavy, and cut with a side-cut machine, so as to be laid in a swath and run over with a machine, a tedder should be used. This should be started as soon as the top of the swath is well wilted, but before the leaves have dried beyond the power of draining sap from the stem. By throwing the alfalfa into the air two or three times, it will be dry enough to go into cocks and not burn. We know by science that alfalfa, even before blooming, has the greatest feeding value, although yielding, perhaps, a less quantity to the acre; that, after blooming, its digestible albuminoids, carbohydrates and fat rapidly decrease, while the crude fiber as rapidly increases and its nutritive ratio becomes wider."

Wm. Robertson also writes to the *Field and Farm* some good suggestions about cutting alfalfa with a self-binding harvester instead of a mower, as follows:

"The past season several of my neighbors and myself cut and bound all of our hay. I have yet to hear of one who was not well pleased with the results. We easily cut from 12 to 15 acres a day, while one man, with the aid of a bundle carrier, did the shocking. There was no bleaching in the sun, the curing being done in the shock. All the leaves of the alfalfa staid in the bundle. When loose alfalfa hay is in good condition to stack, many of the leaves will remain on the field.

"The pitching in the field was much easier and more rapid. The bound hay takes up less room in the mow than does the loose, or if stacked out of doors will keep much better. The bundle is much more convenient in feeding. The smooth sickle, which also works well in other cutting, serves the purpose in hay cutting much better than the rough sickle does. Two objections to the harvester will arise in the mind of the reader—the expense for twine and the length of stubble left in the field. State twine was bought this year for 7 cents a pound.

"The ease and rapidity of work and the best quality of hay obtained much more than offset the cost of the twine. We ran our harvesters as low as they would work conveniently, examined the stubble, and came to the conclusion that what was left over and above the cut of the mower would be of more service to the coming crop of hay than it would be to the stack if we had it in the stack. With our mowers, we shave "three days under the skin," thinking that, because we have added to the bulk of our hay, we have increased the quantity of our fodder. I have heard of curing alfalfa and timothy hay away from the sun, but I never found out how till I tried the harvester."

The excellent item following, along the same line, is from the *Review*, of Spokane, Wash.:

"The conversion of a heavy mass of green alfalfa into a choice quality of hay is an operation calling for no small degree of skill and experience. But the process is one to be learned by intelligent observation and practice, rather than from written description. The first and second crops of each season need to be cured with special care, or they will certainly mold in the stack. Beginners need to beware of this point. The knack to be acquired is that of curing the hay sufficiently to insure its keeping sweet in the stack without becoming so dry as to shed its leaves in the handling. This cannot possibly be accomplished by curing fully in the swath. A method much practiced is to rake the alfalfa, while still quite green, into windrows, where it is allowed to cure somewhat more, and, finally, to make it into moderate-sized cocks, in which it is allowed to stand until ready for the stack. This process makes very nice hay, but, where a large acreage is to be taken care of, it is too slow and expensive. Alfalfa may be cured with entire success in the windrow, but it is important, when cured in this way, that there be ample facilities for putting it into stack very rapidly when ready; otherwise it will become too dry, and much of it will be lost in the handling, especially if it has to be carried from the field to the wagons. Alfalfa should be cut on the first appearance of bloom."

STACKING ALFALFA.

"While receiving some alfalfa last month, we were particularly struck with how the moisture in the ground is kept in motion by capillary attraction," writes the editor of the *Southwestern Farm and Orchard*. "We noticed that some of the bales

were wet and moldy on one side, and asked the party present how this had happened, as we knew there had been no rains since the alfalfa was baled. He told us that the alfalfa had been carefully covered up, but that when he came to the lower tier of the bales, which were stacked in the open, he noticed that the ground upon which they stood was quite damp, although the land all around was perfectly dry.

"Now, this was the result of capillary attraction, which, as we have before had occasion to explain, is continually bringing up moisture from the soil beneath. When this moisture reaches the surface it evaporates, unless there is something to stop it. In this case the moisture came into contact with the alfalfa, and there stayed. In the case of a well-cultivated field, it comes into contact with the surface tilth, which prevents it rising any further. Had the ground been covered with logs or heavy branches of trees, so as to allow the moisture to evaporate from under the alfalfa, the damage would have been avoided, whereas, as it was, one bale out of every eight was quite unmarketable. Probably the bales would have kept dry if small trenches, about a foot apart, had been dug out before the alfalfa was placed on the ground. The moisture would have evaporated through these trenches instead of entering the alfalfa. If the man who stacked the alfalfa had understood the theory of capillary attraction, he would have been saved a considerable loss.

"Without a thorough grasp of the method by which capillary attraction works, mistakes, not only in cultivation, but in other matters, too, are very liable to occur."

A GOOD ALFALFA SHED.

"We do not believe a stack was ever built in the United States that did not waste from 12 to 20 per cent. of the hay, and in many cases from 25 to 30," says the editor of the *Iowa Homestead*. "While all this loss is not avoided by sheds, for nothing short of a barn will prevent some exposure, the greater per cent. of the loss will be avoided by the construction of sheds. We have found 26x40 and 16 feet high to be a very convenient size. We have used 6x6 and 8x8 for the posts, and prefer the former size. Thirteen feet is sufficient width apart for the posts, and, for a shed of the size mentioned, but 10 posts will be required. Where pine is used, it is better to get the posts 16 feet long and bolt them to oak posts set in the ground three or four feet, so that the oak posts, when rotted, can be replaced with new without damage to the shed. These posts can be tied together by four cross timbers, but the one at the end which the hay goes in should be at least two feet below the top of the post, so as to allow the horse fork full of hay full swing in passing in.

"Sixteen-foot boards will roof each side of this shed. They can be battened, if necessary, but if the lumber be reasonably dry it will not shrink enough to do any serious damage. It is astonishing how little water flows into these sheds when the roofs are unbattened. We prefer, however, to batten. The horse fork can be used, the track being suspended from the roof, as in a barn, and the inconvenience of the two inside crosspieces in a barn of the above size can be avoided by putting the hay in in sections, and taking care not to let quantities of it lie across the crosspieces. A shed of this kind can be braced without crosspieces, but not without more or less waste of space.

"Additional expense can be added to this shed very profitably. For example, feeding sheds can be attached to it on three sides, preferably the north, west, and south. These should be 16 feet wide, eight feet high at the rear, and with a good slope to the roof, and in this case the main shed should be boarded down to the roof of the feeding shed. A hay shed of this kind, with sheds around it, will give

2,200 square feet of shed room, or a floor space of a barn 40 by 55. This can be divided into different sections and the stock fed directly out of the mow into the mangers, thus placing a large amount of stock in one place, with the hay all under one roof. A crib of corn or a bin of oats can be very easily constructed in this shed, so as to have the feed all together. One of the advantages of this shed is the protection it affords against the winter blasts, and still another, the fact that if abundance of straw is hauled in the manure can be kept through the winter, and through the summer if need be, under cover and without loss. It is very easy, if a farmer wishes to invest still more money, to make a barn on this general idea, having a large bay in the center and cattle stalls and sheds all around it. In fact, with the exception of the octagonal barn, this plan will give more accommodations than any other plan of barn with which we are acquainted."

If hay is well cured before it is put into the mow there is not much need of making special provisions for ventilators. But if the hay season is a rainy one, the grass is often taken from the field before it is thoroughly cured. This, when it is put into large barns, is apt to heat and be much injured. In order to prevent this, ventilators can be constructed in different ways. If an upright ventilator is desired, place a barrel in the center of the mow and put in hay until the top of the barrel is reached; then pull the barrel up two-thirds of its length, fill in around it as before, and so on until the mow is filled. This leaves an upright opening from the bottom to the top which will serve the purpose admirably.

An upright ventilator made of four 12-inch boards and set in the middle of the mow floor is good, but in using a hay fork this is often in the way and inconvenient. These 12-inch-square boxes can be utilized in another way. Make several the length of the mow in which they are placed, and in each bore a number of two-inch auger holes. Fill in hay to the depth of six or eight feet, then drop in another ventilator, and so on.

BLOAT FROM EATING GREEN ALFALFA.

From the *Southwestern Farm and Orchard*, Las Cruces, N. M.

Green, growing alfalfa is *never* absolutely safe as a pasturage for cattle. When it is full of juices, and immature, they are very fond of it, and are liable to gorge themselves and bloat, if not fed with extreme caution. The greener and more succulent the growth, the greater the danger; and this is always increased when the alfalfa is wet, either from rains or heavy dews. There is less liability to this trouble on fields that have received little or no irrigation. It is true there is a difference in animals with respect to this danger or tendency, and the one that eats moderately and rather daintily is usually safe. If the animal is greedy, and gorges itself, particularly on an empty stomach, the gases are pretty certain to accumulate and probably kill the animal. The advantages of afternoon pasturing are, that the alfalfa is usually dry, and the cattle have at least partially satisfied their hunger. But this cannot always be relied upon as a guide; nor can the fact that plenty of dry hay has been fed and water given beforehand. All these "perfect preventives" have occasionally failed to protect. Neither is salt kept before them a certain safeguard, as some claim, although it is advisable to give salt to cattle. This is the testimony of men of large experience, and it is well to be on the safe side.

Mr. A. E. Gepson, of Colorado, says that the times when alfalfa may be pastured with comparative safety are, when the growth is fully matured and ready to go to seed (when it has taken a brown tinge), and again when frost has checked the

growth and cured the juices. Horses are rarely injured, and swine never, by pasturing. Give the hogs free run on alfalfa, and a little corn to harden the flesh before they are butchered, and the work is complete. The usual remedies for bloat in cattle are, in mild cases, either to elevate the head and forequarters of the animal, by standing it on a stack, manure pile, or the like, when the gases will often escape, or to keep the mouth open with a stick or cob; or give a tablespoonful of hyposulphite of soda; or, in severe cases, use a trocar. The latter is rather a harsh treatment, and should be intelligently and carefully performed. Animals are often injured by the unskillful use of the trocar. The rule is to plunge the trocar into the region of the greatest distension, on the left side, at a point midway between the spines of the last rib and point of the hip, pointing the trocar in and downward, and letting it pass in obliquely to avoid the kidneys.

Mr. J. U. Brown, of Tribune, Kas., states that a piece of rope, well smeared with pine tar, secured in a cow brute's mouth by tying the ends behind its horns or ears, is considered an immediate and quite certain remedy, much used for bloat caused by wet clover or green sorghum, and he has seen it effective in the Bermudas for bloat caused by "May cock," which is a species of clover. After chewing at the tarred rope for a short time the animal begins belching, and relief follows.

TYMPANITIS, OR BLOATING.

By Prof. N. S. MAYO, D. V. S., Kansas State Agricultural College, Manhattan.

This disease is known by a great variety of names, almost every locality having a different name for this condition. Among the most common names are, tympanitis, bloating, hoven, blown, etc. Most of the names are based upon some prominent symptoms exhibited by animals suffering from this disease.

Nearly all domestic animals are liable to bloat, or distension of the abdomen with gas, as a result of indigestion, obstruction of the bowels, or choking. As the causes and treatment of the different kinds of bloating differ considerably, this article will only apply to bloating in ruminants, cattle and sheep, as a direct result of eating a large amount of juicy food.

Bloating, in all cases, is accumulation of gas in the stomach or intestines, or both. This gas is produced by a fermentation, similar to that observed when cider is "working," and the gas escapes in bubbles. There is usually a small quantity of gas given off from the food during normal, healthy digestion, but so small that it causes no trouble, and passes off readily through the intestines, though sometimes from the stomach, up the esophagus, and out of the nose or mouth — "belched up," as it is commonly expressed. These gases which cause an animal to bloat are generated in considerable quantities if a large amount of juicy, green food is eaten. Alfalfa, clover and frozen roots are very liable to produce bloating.

It is well known that only part of the animals in a herd pasturing upon clover or alfalfa bloat; so the blame cannot be laid entirely upon the food, but is probably the result of a slight derangement of the digestive organs, not ordinarily noticed, but easily aggravated by certain foods which ferment easily. Animals that are ailing are very liable to bloat when turned on alfalfa pastures. Alfalfa and clover are much more liable to produce bloating if wet with rain or dew, and especially hoar frost, and animals are more apt to bloat if turned into the pastures when very hungry, as they gorge themselves, and the food is not properly masticated. Hence, if cattle are kept in yards until the clover or alfalfa has dried off, they should be fed — not allowed to go hungry to the pastures.

It is generally believed by those who have had considerable experience in pasturing clover or alfalfa, that cattle and sheep are less liable to bloat if they have free access to dry food, such as hay or straw. Common bloating, or hoven, occurs in animals having a compound stomach and that chew the cud—ruminants, as they are called. Of our common domestic animals, cattle and sheep belong to this order.

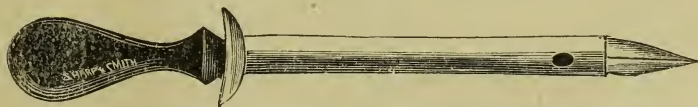
Bloating is a distension of the rumen (paunch) with gas. One of the first symptoms noticed is, that the animal stops feeding, and remains lagging behind or stands by itself. Rumination, or chewing the cud, is suspended; the animal appears dull and listless, the back slightly arched; the whole abdomen or belly is distended with a prominent swelling on the left side just forward of the point of the hip. If this swelling is tapped lightly with the fingers there is a hollow, drum-like sound; hence the technical name, *tympanitis*.

The rumen being distended with gas not only makes the animal appear much fuller than usual, but it presses forward on the diaphragm, or "midriff," and this presses against the lungs, and interferes seriously with the animal's breathing. The breath is short and rapid. The animal often grunts, or moans, with each breath. The animal's nose protudes, and there is a driveling of saliva from the mouth. Sometimes there are quite severe colicky pains, shown by the animal's kicking at its belly and stepping about uneasily. Sometimes, also, the pressure is so great as to cause eversion or bulging out of the rectum. The symptoms of bloating are so prominent, especially when the history of the case is taken into account, as to make this disease very easy to recognize, even by an ordinary observer.

When animals die from bloating, death usually takes place in the following manner: The diaphragm is pressed against the lungs so hard that the animal cannot breathe, and it dies of suffocation. Animals usually remain standing until near the end, when they gradually lose consciousness, stagger, and fall, and in falling rupture some of the vital organs.

The treatment adopted must depend somewhat upon the condition of the animal. If the animal is badly bloated, with labored breathing and staggering gait, energetic measures must be resorted to at once. The best and most satisfactory treatment for bad cases is tapping. This consists in making a hole through the skin and muscles, over the prominent swelling on the left side, into the rumen or "paunch," thus allowing the gas to escape at once, relieving the animal.

The best method of tapping is by means of an instrument called a *trocar* and *cannula*. A trocar is a sharp-pointed instrument, five or six inches long, and about the size of a lead pencil, with a handle at one end. Over the point of the trocar slips a tube, called a cannula, not quite as long as the trocar, with a wide flange around the upper end of the tube, as shown in the accompanying cut. The instrument described is about the size for cattle; smaller ones are made for sheep, although the cattle trocar can be used for sheep, provided it is not pushed in its full length, one-half to two-thirds being about the proper distance.



TROCAR AND CANNULA.

To use a trocar and cannula, proceed as follows: Tie the animal so it cannot get away. With a sharp knife, make a small incision through the skin over the prominent part of the swelling on the left side. This incision should be made about half way between the point of the hip and the last rib, and should be large enough to admit the trocar and cannula readily. The incision should be made quickly; then

the animal will not notice it. After the incision is made the trocar and cannula are pushed quickly in and directed downward, inward, and forward; push the trocar in until the flange of the cannula rests against the skin. Withdraw the trocar and the gas will rush out; that is, it usually does so; occasionally, however, the end of the cannula is plugged up with green food. This can usually be remedied by pulling out the cannula part way, or pushing the trocar in again and withdrawing it. If this does n't work, tap the stomach again in another place, using the same hole through the skin. The escape of gas is usually accompanied by a small quantity of green food.

If a trocar and cannula are not available in an urgent case, a knife can be used very successfully—a good-sized pocket knife, pushed quickly through the skin and muscles, in the same manner as described for the trocar and cannula. Care must be taken that the edge of the knife blade is not turned towards the animal's tail, as it sometimes jump forward, and a much larger hole cut than was originally intended.

A careful and observing stockman of Colorado, who has had a large experience with alfalfa bloating, informs me that he prefers a moderately small sharp butcher knife to either a trocar and cannula or a pocket knife. It gives relief quicker and with no bad effects. Sometimes, if the opening through the skin is small, made by a small knife, a quill or small tube is fastened in to keep the incision open, so the gas can escape. It is usually necessary to keep the incision open for several hours. The only bad result of tapping is, that occasionally green food gets outside of the rumen into the abdominal cavity in sufficient quantities to cause inflammation and death; but if the operation is intelligently performed, these bad results are extremely rare—probably not more than one case in 100. If the weather is warm, care should be taken that flies do not bother the wound through the skin.

If the case is not severe enough to warrant tapping, the following remedies will be found useful: A gag, made by winding a good-sized rope back of the horns and through the mouth, or a bit, made of a piece of wood the size of a fork handle, can be tied in the animal's mouth. The bit should be large and smooth, to prevent injuring the mouth. Then a small handful of salt should be thrown well back on the roots of the tongue. This causes the animal to work its tongue, increases the flow of saliva, and thus favors the regurgitation, or gulping up, of the gas. The salt and saliva which is swallowed helps to stop the fermentation.

Blankets wrung out of cold water and wrapped around the abdomen or belly, or cold water dashed on with a bucket, often give relief. Turpentine given as a drench, in milk sufficient that it will not irritate the animal, is good, two ounces for adult cattle and one-half ounce for sheep being a dose. Hyposulphite of soda, dissolved in water and given as a drench, is good; one ounce for cattle and two drachms for sheep. This can be repeated every half hour for two or three doses. Aqua ammonia, two ounces for cattle and one-half ounce for sheep, well diluted with water; carbolic acid, cattle 30 drops, sheep 8 to 10 drops, in sufficient water; common soda, in half-ounce doses for cattle and one-half drachm for sheep, can be given. In giving medicine as drenches, they should be well diluted with water or other substances until they will not burn when touched to the tongue. In giving drenches, be careful and not choke the animal. If the animal coughs or struggles violently, stop at once until it recovers somewhat. Give drenches slowly.

Drenches are best administered from a long-necked, thick, glass bottle, or drenching horn. Take hold of the nose with the left hand, by putting the thumb and finger in the nostrils, while an assistant takes hold of the horns, and tips the head back. Standing on the right side of the animal, with the right hand put the neck of the bottle in the right corner of the mouth, and pour the medicine in slowly. After the bloating has been relieved, it is a good plan to give the animal a purgative—

one pound of Epsom salts, with one-half pound common salt, for cattle; and for a sheep, six ounces of Epsom salts and three ounces of common salt, dissolved in plenty of warm water, and given as a drench. The animals should also be dieted until their digestive organs regain their normal condition. By dieting, I do not mean starving, but plenty of easily digested and nutritious food. An animal that bloats once is very liable to bloat again. By judicious handling and feeding, by watching animals closely, and treating them in time, few will be lost by alfalfa bloating.

ALFALFA SEED AS A MONEY CROP.

From *Orange Judd Farmer*, January, 1895.

The immense increase in alfalfa culture has caused a large demand for the seed. To get at the facts concerning the present supply and future prospects for alfalfa seed as a money crop, *Orange Judd Farmer* has made extensive inquiries throughout this country and Europe. Details eliminated, reports show that alfalfa growing is highly profitable in the West, that it is gradually creeping into the central states, is known to some extent in the South, and in the middle and eastern states is produced only in a small way. The crop is thus coming into general use over a large area, and the market for alfalfa seed is constantly expanding.

At present there is an outlet for all the surplus alfalfa seed, with stocks to-day hardly sufficient for prospective demand. The seed is mostly raised in California, Utah, Colorado, and Kansas, and to some extent in Arizona and New Mexico. The commercial bushel everywhere is 60 pounds, but there is no regular market in a commercial sense, those who have any surplus selling to local merchants, whence the seed finds its way to other sections where it is needed. In a few localities, attention is being given to securing and handling the seed in a large way, both for home distribution and export account.

THE MARKET FOR ALFALFA SEED.

Because of the absence of an established market in a commercial sense, with little knowledge of how the supply varies in different localities, prices of alfalfa seed vary widely and are usually governed by local conditions. This fact is illustrated by the table below, based on returns from 563 correspondents. The first column shows the usual range of prices that farmers get for alfalfa seed in ordinary seasons, then follow the range of prices that farmers can get for seed at the present time, and also the retail price at which alfalfa seed is sold from the stores. The average yield of seed per acre, and the yield of the 1894 crop, are also stated.

STATES.	Wholesale price per pound, in cents.		Retail price per pound, in cents.	Yield per acre, in bushels.	
	Usually.	At present.		Average.	Latest, in 1894.
Nebraska.....	7 to 8	6 to 9	8 to 12	7 to 10	8 to 10
Kansas.....	7 " 12	7 " 10	7 " 12	4 " 7	6 " 7
Oklahoma.....	.....	10 " 12	13 " 15	6 " 8	7 " 8
Texas.....	6 to 8	10	10 " 12	.....	5 " 7
Colorado.....	5 " 10	5 " 6	6 " 8	4 to 8	4 " 6
Utah.....	4 " 8	6 " 9	10 " 12	6 " 10	4 " 6
California.....	6 " 12	5 " 9	9 " 15	7 " 9	8 " 9
Washington.....	7 " 12	6 " 10	9 " 14	5 " 10	6 " 7
Wyoming.....	8 " 12	5 " 6	6 " 9	5 " 8	4 " 6
Idaho.....	6 " 12	7 " 10	10 " 12	7 " 8	8
Arizona.....	6 " 12	5 " 7	7 " 10	3 " 5	4 " 8

Seedsmen in the principal Eastern cities advertise alfalfa seed at 25 to 30 cents per pound in a small way, and around 20 cents per pound in bushel lots.

EXTENT OF THE HOME DEMAND.

California does not raise enough seed to supply the home demand, and secures liberal quantities from Utah and Colorado. The crop is closely sold every year, and at the present time there is next to no old seed available. It is customary to cut one and sometimes two crops in a season before saving one for the seed, and after the last cutting the field is used for winter pasturage. The yield varies widely, from 3 to 15 bushels per acre, with eight bushels as a fair average. On the Pacific coast, the price of alfalfa hay, and, in a secondary way, the price of seed, depends largely upon the season and other hay crops. With liberal yields of barley and wheat, alfalfa is in less demand, but in poor seasons becomes the principal crop, and prices advance. The consumption of seed in California, Washington and Oregon is increasing, for one reason, because farmers are turning their attention more to dairying, owing to the low prices of wheat and fruit, and the same is true, in a general way, of Wyoming, Colorado, and Arizona.

No state has given alfalfa such a boom as Kansas has during the past two years, where it will largely take the place of wheat and corn in certain counties the coming season, making an extraordinary demand for seed. Many Kansas farmers have some seed to spare, and others will grow it on a large scale this season, having thrashed out as high as 12 bushels per acre last year in some cases. Nebraska is likely to imitate the Kansas boom, and other states will call for more seed than ever before.

FOREIGN OUTLET FOR THE SEED.

A large proportion of such seed as is not actually consumed at home in the western states goes almost exclusively to Europe. The present price in Chicago is around 7c. per pound for export. Little of it is sent in on consignment, as agents for the big seed houses scour the country west of the Missouri river for surplus offerings, finding perhaps as much in Utah as anywhere else. In recent years, a weed called sweet clover, which can be detected by its odor, has crept into the seed and caused much loss to many exporters as well as those in the domestic trade, owing to the inability to guarantee the alfalfa absolutely free from the unwelcome admixture. The seeds from the weed named so closely resemble alfalfa that they can only be detected by the closest scrutiny. The plant from this false clover is a luxuriant grower, but having a very tough fiber, and consequently not easily digested, is not liked by cattle and at times causes no end of trouble.

EUROPEAN DEMAND FOR ALFALFA SEED.

Alfalfa receives much favor in other parts of the world, and has long been a well-known plant, England being a large buyer of the seed to replenish worn-out grass land. In some localities where it is grown the saving of the seed crop is not considered profitable. For instance, in Switzerland and northern Europe and in Great Britain the seed is generally purchased in France, and the greatest preference shown that which is raised in Provence. This bears the reputation of being the best in the world. The seeds are larger and possess high germinating power, hence always command a higher price than that raised in America or other portions of Europe. Italy and Hungary furnish more or less seed. In Europe, old fields soon to be broken up are selected for the seed crop, because plants cut when in seed are much exhausted and to some extent perish. In southern countries seed is taken from the second cutting, but in Germany often from the first.

The seed is considered ripe when the pod has become spirally twisted and dark in color. At this time the seeds are yellow and of a cheesy consistency. The seed crop is harvested the same way as red clover, and in southern Europe it is customary to thrash immediately after cutting. The yield per acre is variously estimated at

5 to 12 bushels. Alfalfa seed reaches Great Britain at irregular intervals from North and South America, some of it being almost as good as the French standard, although the quality of that from South America varies so much that it is almost impossible to get bids without first seeing sample. Prices during the year just closed have been much lower than previously, owing in part to a liberal crop on the continent, and the seed is now quoted in London at \$2.75 and \$3 per bushel of 60 pounds, or much below the value in this country.

The demand for alfalfa seed in Great Britain is not large, and varies little year after year. After sweet clover a common impurity in alfalfa is dodder, and the greatest care should be taken to clean the crop from this pest, which creates great havoc in land where it unfortunately becomes established. Adulteration is rarely attempted, as such practice would be easy of detection. In some of the French and German markets alfalfa seed is to-day 50 cents per bushel higher than in England, and it seems as though those first named might offer a good opening for the best American seed, providing import duties are not too heavy.

Something is yet lacking before the business can be regarded in a satisfactory condition. As shown, prices cover a very wide range and are entirely devoid of anything like uniformity. For one thing, in order to establish a regular market for the seed, some system of grading must be evolved, perhaps on the same lines as those governing clover and other grass seeds. This can perhaps be best begun in sections which now produce the greatest quantities of choice seed making a specialty of it, and have the greatest surplus available for distribution, such as Colorado, Utah, etc. For example, there is this season an excess of seed in certain Arizona towns which should be handled to better advantage than now seems probable. So comparatively new is the industry, that at present the majority of grain dealers in the big markets know little or nothing of the seed or its commercial value and how best to secure full prices for shipments consigned to them from the interior. Here is an opportunity for the Granges or kindred organizations to work out a more intelligent method of marketing the surplus or securing needed requirements of the seed from remote sections for home use.

ALFALFA AND HONEY PRODUCTION.

By EMERSON T. ABBOTT, ex-president North American Beekeepers' Association, St. Joseph, Mo.

The value of alfalfa and its possibilities seem to me to be very great. It is one of the best plants known for the production of nature's finest and most healthful sweet. Those who have never given any attention to the production of honey can hardly realize how much wealth is being practically lost every year for the want of bees to gather it up, or how large a part of the value of the 90,000 acres of Kansas alfalfa now wastes its sweetness on the desert air. Alfalfa produces as fine honey as any plant known, and the climate of Kansas is especially suited to the production of a high grade of this, as dry atmosphere and a high altitude are both conducive to the best results in honey production. I know from experience that the alfalfa honey of eastern Colorado and western Kansas is rarely equaled, and I doubt if ever surpassed in body and richness of flavor, and the pure alfalfa honey has that rich, white color which renders it peculiarly attractive.

Wherever there are 100 acres of alfalfa there is abundant pasture for at least 25 colonies of bees; and especially is this true where one of the cuttings is left until the seeds ripen. Of course, if the plant is cut just as it comes into bloom, the flowers will not have much chance to secrete nectar; but where the crop is not cut

until the seeds are ripe, or where it is pastured—but not sufficiently to prevent it from blooming—it will yield a bountiful supply of the very finest quality of honey. More, I may say in passing, that I am quite sure that the advantage of bee keeping to those who grow alfalfa will not be confined alone to the value of the honey they gather, but the value of the alfalfa crop will be thereby increased by the larger yield of seed that is sure to follow the introduction of bees.

Seeds will not ripen in any plant unless the pollen of the stamen is in some way brought into contact with the stigma, so that the fertilizing cell may find its way into the ovary. I have not space here to tell how this is, or why it is, and for most of my readers this may not be necessary. Suffice it to say that it is, and, not only this, it is of great advantage to the plant that the pollen come from a flower found on some other plant, as cross fertilization, as it is called, adds largely to the productiveness of the individual plant, and gives strength and vigor to all plants produced from seeds that have been so fertilized.

Perfect fertilization, and this may be understood to include cross fertilization, then, is very important to all plants that produce seed. I very well know that the wind many times acts as a pollen bearer, but, where plants yield a bountiful supply of honey, there is nothing like the busy bee to secure this in its perfection, for such plants will receive many visits daily, if there are an abundance of these little workers in close proximity. I may remark, further, that the benefit in this direction will not be confined to the alfalfa alone, as it has been demonstrated that many of our fruits, of which the apple is a conspicuous example, are not self fertile. That is, the pollen from the stamen of an individual flower will not act on the stigma of that flower. So it may be seen that the bees will add to the wealth of the fruit grower as well, by giving him larger and more perfect fruit, which will not windfall but will hang on the tree until fully ripened.

A point which I wish to emphasize here is, that the nectar of the flower is largely, if not entirely, wasted, if not gathered by the bees. The plant is not in the least impoverished by the visit of the bee, so that all that is made out of the honey is that much clear gain. But, says some one, why is the nectar secreted, if it is of no value to the plant? Evidently to attract insects, that they may do for the plant what it is not able to do for itself, namely, secure the perfect pollination of the stigmas. The plant pays the bee for service rendered, and the bee stores away the nectar it gets in payment for this service, and thus adds to the wealth of its owner by furnishing him with a delicious sweet, which was not unfittingly called, in olden times, "The drink of the gods."

I have said enough, perhaps, to enable the reader to see that bee culture has a great future in Kansas, and it will be fitting now for me to discuss this subject briefly from the standpoint of the farmer and fruit grower. There are a great many people who would like to keep a few colonies of bees, in order to secure honey for their own use, if they knew just how to go about it. Many have an idea that it requires some special skill to care for bees properly, or, rather, they have a notion that some people are so constituted that they can handle bees with perfect ease, and that the bees have a special liking for all such people. Nothing could be further from the truth, for the fact is bees will treat all people alike, if all people act alike when they are about them. In other words, there is no special charm about some individuals which enables them to handle bees; the "bee tamer" of olden times was largely a myth. Anyone who will carefully study the habits and disposition of bees can learn to handle them—that is, anyone with ordinary intelligence and perseverance. A man who can successfully handle stock and make it remunerative can handle bees. Any young man or woman who knows how to make poultry keeping a paying institution can learn to profitably care for bees. The main thing is to

start right and learn as one goes. It does not require the investment of a large amount of capital to begin bee keeping. A very few simple and inexpensive tools and one colony of bees is all that is necessary. It will be a great advantage to add to this outfit a good book on the subject of beekeeping. This is not absolutely necessary, but will be found very helpful, as it will answer a multitude of questions that are sure to come up as the seasons come and go. There are a number of good books, but perhaps the revised Langstroth, which can be had for an outlay of \$1.40, is the best, all things considered.

The bees should be secured in the spring and from some party living near home, if possible. They should be in what is known as a modern hanging-frame hive, and the colony should be strong and vigorous at the time of purchase. The safest time to buy bees is just as fruit comes into bloom, for they have then passed the period where there is much danger of what is known as "spring dwindling" taking place. They should be placed in the care of some individual member of the family whose business it should be to look after them and give them such care and attention as they will need during the season. A good colony of bees, having access to an abundance of alfalfa bloom, should cast a good large swarm, and gather, for the novice even, at least 75 pounds of fine, rich and delicious white-comb honey. It will be a very easy thing to figure how much value this honey and increase will stand for. I have made what I consider a low estimate, as I would rather make it too small than too large.

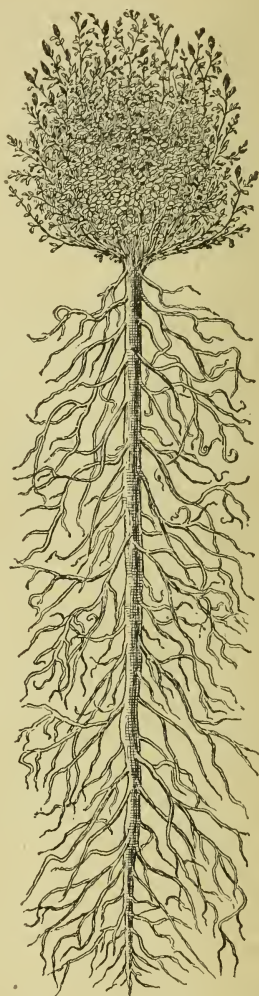
It will not be worth my while to try to explain how to handle bees, as this information can be found in any book on the subject. I will say, however, that it is not necessary to buy any patent hives, as this will not be of any advantage to the bee keeper, and may prove a great detriment. No one should think of keeping bees in this age in anything but a modern hanging-frame hive; but this is not necessarily a "patent hive." There is nothing of any special value about a beehive upon which there is any patent; so when a man begins to talk of a "patent" beehive, you may know he has something which will prove of no value to the ordinary farmer or fruit grower who wishes to keep bees.

I trust I have said enough to elicit the interest of readers, and that it may be the means of causing them to think of the great waste which is going on where this nectar is constantly being secreted and there are bees to gather it. I feel confident that no family that has once known the pleasure and satisfaction of having plenty of honey for daily use without being forced to buy it will ever think of doing without, at least, a few colonies of bees.

Let me say again, in conclusion, that alfalfa is one of the finest honey plants in the world, and that those who suffer this healthful sweet to go to waste on their farms for want of bees to gather it are losing in more ways than one.

THE SILENT SUBSOILER.

There are some silent subsoilers that do their work with ease, and, in their way, as effectually as any team or plow ever hitched, although in some lands use of a subsoil plow is essential to the best beginning of such work. The clover plant is righteously famed as one of these, and alfalfa is its superior. Its roots work Sunday as well as Saturday; night and day; they strike 5, 10, 15 or 20 feet deep, making innumerable perforations, while storing up nitrogen, and when these roots decay they leave not only a generous supply of fertility for any desired crop, but millions of openings into which the airs and rains of heaven find their way, and help to constitute an unfailing reservoir of wealth, upon which the husbandman can draw with little fear of protest or overdrafts.



AN ALFALFA PLANT AND
ITS ROOTS.

[By permission of Northrup, Braslan, Goodwin Co., seedsmen, Minneapolis, Minn.]

"Its long, heavy roots disturb the subsoil, push and crowd the earth this way and that, thus constituting a gigantic subsoiler. These roots become an immense magazine of fertility. As soon as cut, they begin to decay and liberate the vast reservoir of fertilizing matter below the plow, to be drawn upon by other crops for years to come."

REPORTS OF KANSAS GROWERS.

BY COUNTIES.

BARBER COUNTY.

F. L. Gordon, Lake City.—Have had 10 years' experience with 40 to 100 acres of alfalfa, grown on "second bottom," with soil of black, sandy nature, and a sandy subsoil to depth of three or four feet, underlaid with stiff, red clay. Water is found at a depth of 10 to 12 feet, and, except in very dry seasons, the ground is moist all the way. Sow 20 pounds of seed per acre, on deeply plowed ground; harrow lightly and finish with brush or roller. Prefer to sow between first and middle of April, or as soon as the frost is out of the ground. Always mow the weeds the first season, and if there is a heavy crop they should be hauled off. In a good season there is one crop of hay the first year. Alfalfa is not particularly liable to winterkill. I get three cuttings every season, after the first, averaging in all about four tons per acre. I cut for hay as soon as in full bloom, and, after leaving in the sunshine half a day, rake. Build ricks 10 feet wide, and as long as desirable. If properly cured and stacked, there is no danger of molding. If seed is to be saved, let the pods become brown before cutting, preferably of the second crop. On land worth \$10 or \$12 per acre, the cost of hay in the stack is about \$2 per ton. I think alfalfa is equal to any other hay for feeding horses or cattle, and the pasturage is good for both. It makes excellent hog pasture, and I believe it will support more stock than clover will. I always feed a little grain with it. Animals allowed to run on it when wet are liable to bloat. The plant is at its best in the second and third years; in 8 or 10 years it will become grassy in spots, and need reseeding. On the high prairies the seed will sprout and live, but frequently not make sufficient growth to be profitable, unless the conditions are exceptionally favorable.

BUTLER COUNTY.

J. B. Stone, El Dorado.—My experience in alfalfa-growing extends over seven years, with 35 acres of "bottom" land, having a black loam surface and clay subsoil. Well water is reached at 15 to 20 feet, through soil moist nearly all the way. Prefer to sow about the middle of April here, after deep plowing, and pulverizing with harrow, 20 pounds of seed to the acre, harrowed in lightly. During the first year, keep it well mowed until the last of August, after which it will make, on good, rich land, one to two tons of hay. It does not winterkill here. In following years there are four cuttings for hay, yielding about two tons per acre each. When in good bloom, cut for hay, let cure about 24 hours, and stack. I have tried ricks and round stacks, and prefer the latter. If cut in full bloom, it does not mold or heat. The second crop is best for seed. Cut when the pods are brown, with a self-rake machine; let lie in the field until dry; then thrash. On land worth \$50 per acre, the estimated cost of alfalfa in the stack is \$2.50 per ton. Seed yields are 7 to 15 bushels per acre; is thrashed with the ordinary thrashing machine, at a cost of 60 cents per bushel. I consider one acre of alfalfa worth two acres of corn for feeding all kinds of stock. It is good pasturage for cattle, horses, and hogs. One acre will pasture 40 head of hogs through the summer. Cattle are liable to bloat on rank alfalfa in the spring and summer. When it is in full bloom there is no danger, and they will put on three pounds per day. It requires about three years to attain its best yield.

CHAUTAUQUA COUNTY.

J. J. Willson, Cedar Vale.—Eight years ago, I commenced with 20 acres, and now have 110 acres. I consider my alfalfa meadow worth more to me every fall and spring, for pasture, than that many acres of corn, and I get a seed crop of about two bushels per acre. Any man who has the land, and keeps hogs, without an alfalfa pasture for them, is losing one-half the possible profit on the hogs, at best; it is astonishing how many can be kept well on a few acres, without any other feed. My land is mostly upland, with black loam surface and stiff clay subsoil, 12 to 30 feet above well water. Plow the ground, and let it settle well; then sow 20 pounds per acre, with seeder or drill, and cover about the same as wheat. If there is plenty of rain, the best time to seed is the last of August; otherwise, in April. During the first season, cut the weeds and mow one crop of hay. There is no danger from frost here. I pasture until the first of May and then cut the first crop, which would be the second, if not pastured. Mow for hay when in full bloom; let stand a half day; rake, and let cure two days before stacking in round stacks. If stacked too green, or damp, it will mold, but stock will eat it. For seed, let all the pods turn yellow, or black, then mow; rake right after the machine, and shock. A good crop of seed is often ruined by cutting too green. An ordinary yield is two bushels, and it costs \$1 for thrashing and cleaning. A good millet machine will thrash it satisfactorily. The estimated cost of hay in the stack, on land valued at \$10 per acre, is \$1.25 per ton. As food for farm animals, I consider the hay worth more than either timothy or clover. As pasture, it is worth twice as much as clover, for cattle, and I prefer it for hogs, as it will not kill out so easily. It will pasture more stock hogs than any other grass I have ever seen. Once in a great while cattle will bloat, but I never lost an animal. Stick with a knife about eight inches from the backbone, between first and second ribs. The straw is not quite so good as the hay.

CLARK COUNTY.

W. J. Workman, Ashland.—Beginning in 1890, with 40 acres of alfalfa, I have increased my acreage since to 300. Except an experimental plat of two acres, on upland with "gumbo" subsoil, it is in "first" and "second bottom," spaded easily to sheet water, 5 to 12 feet below. On cultivated land, the best preparation is fall plowing and early spring harrowing and leveling. Drill, with press drill, 12 pounds of seed per acre, two inches deep. Newly-broken sod thoroughly disked gives the most certain stand. Best time for sowing here is from March 20 to April 10. As soon as the plant on the best lands is from 10 to 14 inches high, it should be mowed down close to the ground, in order to destroy the annual weed growth. If the weed growth is heavy, it should be raked off clean. If light, it may be left on the ground as a mulch. This cutting will usually hold the plant back through the dry weather of July, and the short stalk will endure almost any amount of drought. The cutting destroys the weed growth, and also decreases the amount of moisture required by the alfalfa. If abundant irrigation is given in July and August, it will be seen that the alfalfa has grown about a foot or more, and that the number of weeds is less. The mowing machine should be started again, and this time, if the stand is good, there will be enough alfalfa among the weeds to pay to stack. Nor should anyone expect to get rid of all weed growth the first year. After the second mowing, a disposition on the part of the alfalfa to stool out and become stalky will be observed, unless the seeding has been too heavy. While it may be all right to sow 20 or 30 pounds of seed on carefully prepared land that is to be irrigated, nonirrigated alfalfa is a stooling plant with a great taproot, and the plants occupy a space of a foot or more in diameter, and must not be crowded. My experience is that from 8 to 12 pounds of seed is enough to sow or drill. Many failures are caused by seeding too heavily and not mowing often enough, for the mower is the cultivator for alfalfa.

It must not be pastured at all the first season, and no stock turned on it the following year until after the first crop of hay has been saved. After that, one can do as he pleases, but my experience is that a piece of good alfalfa meadow will be so highly prized that its owner will not let a chicken range on it. I do not think that anyone can afford to pasture alfalfa, because it is too valuable to take the risks. By pursuing these directions, a well-established meadow is made the first year, but unless one mows and cleans as directed, he need not expect thoroughly clean hay until the last cutting the second year. The time ordinarily given as proper for cutting alfalfa for hay does not apply to the treatment of the meadow in its first year. The time to mow this is when the mixed growth of weeds and alfalfa is high enough for the mower to get at it. It is a good rule, in the first mowings of an alfalfa meadow, to leave the cutting on the ground. This often prevents sun scald, and serves as a mulch to the tender crowns of the young plants. Should rains be abundant, hay may be saved after the second cutting. It does not winterkill here. Ordinarily, there are five cuttings a year, averaging $1\frac{1}{2}$ tons per acre each. When the plant is in full bloom, the hay is cut in the morning, and put into cocks the same day, curing there several days before stacking. I have had no heating, but the stacks are liable to take water badly, unless built with hand forks. Cut for seed when the bloom has all dropped and the top burs begin to turn brown. The second crop is usually the best one for seed, but two crops of seed may be saved. It should be thrashed with as little handling as possible, as the seed wastes badly out of the shock if dry enough. The ordinary thrashing machine does not save all the seed. The cost of thrashing and cleaning is 35 cents or more per bushel. An average crop is five bushels per acre. Valuing land at \$25 per acre, the total cost of alfalfa in the stack, without irrigation, is about \$1.30 per ton.

I like alfalfa hay much better than clover or timothy for feeding farm animals, and one acre of pasture is easily worth two of clover for swine. When hogs are fed a small quantity of grain daily, 10 will find abundant pasture on one acre. They weigh about 150 pounds at six months old, and after that the gain is slow and unprofitable. We have scarcely any dew in this vicinity, and I turn all kinds of stock into the pasture with impunity. Have weaned 300 calves on rank alfalfa, without losing any or seeing a case of bloat. Stock cattle are extremely fond of the straw, and consume it entirely. My milch cows, colts, mares, work horses, etc., are always in fine condition, fed almost exclusively on alfalfa. I do not feed one-tenth as much grain as my neighbors do who have no alfalfa, and are compelled to accomplish the same work. The oldest meadow in this county is six years old, and it is the best; after the third year, very little improvement can be seen. I have been experimenting, in a small way, and believe that any fertile upland, where a stand is secured (this is somewhat difficult), will yield an average of three tons per acre, or a seed crop of two or three bushels and one or more tons of hay. It is much easier here to secure a stand on sod newly broken than on older ground. I have heard of one successful attempt at growing seed by planting in rows two feet apart and cultivating thoroughly. Fifteen bushels of seed was obtained at two cuttings. I shall plant extensively in this manner next season, having great faith in its success. The largest yield per single acre was made last year, on subirrigated "first bottom," viz.: 8 tons of hay and straw and 5 bushels of seed. The hay was worth \$8 per ton, and the seed sold for \$6 per bushel; gross returns for the acre, \$94.

CLOUD COUNTY.

M. H. Creager, Jamestown.—I have had five years' experience with alfalfa, on 30 acres. All of this is on upland, having a decided eastern slope. The soil is clay, with spots of "gumbo." About half of the tract lies above a limestone formation,

while the portion on the lower slope has a heavy clay subsoil. The soil is dry, and water is probably no nearer the surface than 80 feet. I have found the best preparation for seeding to be deep plowing, thorough pulverizing, and heavy rolling. I sow from 15 to 20 pounds of seed to the acre, and have had the best success with a broadcast seeder, with light harrowing and rolling after. The seed should be sown as soon as danger of frost is past in the spring—say from April 20 to June 1. I think it is important during the first year to cut the weeds, and, if the growth is so heavy that there is danger of the mowed weeds covering the young plants too deeply, they should be raked and hauled off. I do not find that alfalfa is likely to winter-kill, excepting when sown late in the fall, and the plants are consequently tender. I cut for hay when the earliest blossoms begin to fade and the seed pods to develop; for seed, when the foliage and stems are well browned and the later pods are well developed. I think the second cutting is best for seed, unless the early part of the season be dry. My practice in cutting for hay is to cock the alfalfa as soon as it is thoroughly wilted, and let it remain in the cock to cure, say eight days. I think it needs only enough sunshine to wilt it. If well cured in the cock, there is not much danger that it will heat in the stack. In finishing a stack, a covering of a foot thick of green alfalfa serve a good purpose in protecting the body of the stack. The yield of seed per acre varies from 1 to 12 bushels; perhaps four bushels is a fair average.

For young stock and for horses not grained, I think alfalfa is most valuable; for teams eating much grain and worked, timothy is better. In comparison with red clover, acre for acre, as pasturage for swine, alfalfa seems to be preferable, making more rapid growth and producing more flesh. I think that sheep would graze alfalfa so closely as to injure it. Horses do well on it. Cattle on alfalfa pasture are very liable to bloat; "tapping" seems to be the most reliable means of cure. Alfalfa straw, after the seed has been thrashed, has about half the feeding value, ton for ton, of alfalfa hay cured in the regular way, provided it is not left out to bleach. High, dry land has not given satisfaction in this vicinity in maintaining a stand of alfalfa. I am satisfied that low, moist lands are far better. The crop requires about three years to attain its best yields, and I have seen no indications of its ever failing, save on highlands, or where pastured too closely. My idea is that very high land, with clay subsoil, will not prove profitable in alfalfa without irrigation. I do not irrigate. A peculiar merit of alfalfa as a crop lies in the marked effect which its cultivation has in smoothing rough and uneven lands. Fields which have been gullied into ditches and sharp "divides" by heavy rains become, within a few years after seeding to alfalfa, as even of surface as unbroken sod. The dense masses of alfalfa roots in the gullies prevent further washing, while the rank growth of stems catches the soil and crop refuse that come down from the higher portions of the field, with the very gratifying result that the ditches soon become entirely obliterated. For this reason, it is extremely desirable that, in seeding to alfalfa, a good stand be established in the gullies and low places. The rapid root-making qualities of the plant make this not at all difficult, except when washing rains come within two or three weeks after seeding, in which case reseeding may be necessary. When once the plants have struck firm root, no rain will take them out, and no ordinary covering of debris will smother their growth; and within four or five years they will have accomplished much toward smoothing the inequalities of surface which are so annoying.

COFFEY COUNTY.

Clark Belles, Burlington.—In April, 1893, I sowed four acres of alfalfa on upland, with limestone and loam soil, and a subsoil of rather stiff clay. Water is found at a depth of 10 to 15 feet from the surface, the soil being moist all the distance to

water. In digging, two strata of rock are found, the first three to four feet from the surface, the second five to eight feet. In the fall I plowed deep, sowed wheat, and it froze out during the winter; I then sowed alfalfa, about April 15, broadcast, one peck per acre; harrowed with a common spike harrow. I did not give my first crop proper treatment, and lost thereby. It should be mowed in six weeks, at the farthest, and repeated as often as the weeds seem to be getting the advantage. My opinion is that, after a good stand is obtained, the winter will not kill it. I cut the first growth for hay about June 30, when in bloom; cut the second growth about September 6, for seed, after the pods had turned black. The second crop is preferable for seed. I cut one day and stack it the next, in common round stacks; it has kept well. I am informed that the clover huller has done good work here in thrashing alfalfa. My stock like alfalfa hay. I sowed about one-half acre on carefully prepared ground, beside a field of red clover, which was my hog pasture, and could not wish for a better stand. When about two or three inches high, my hogs went to work on it; they left the red clover and fed on the alfalfa continually, until they pulled the last plant out by the roots, the soil being very loose; this convinced me that they preferred it to red clover. My alfalfa has stood the long dry season better than any crop I have, even prairie grass; my red clover was badly killed, while my alfalfa does not look as if there had been a dry season, continuing green all the time. I believe alfalfa will be extensively raised on the uplands of Kansas, as it makes a rapid growth. I cut mine September 6, and now, September 27, it is over six inches high, and I am saving it for late pasture. Clover which was cut for seed three weeks earlier has not made one-third the growth. My crop of alfalfa seed was made without one drop of rain, the straw being about 15 inches high. On some parts of the field there was manure, and there the growth was the rankest. I think the greatest difficulty is in carrying it through the first summer, as weeds and crab grass are its worst enemies. I notice that after every cutting mine improves. In the spring, my alfalfa started a rapid growth, and was four inches high when a freeze came, which was very hard on it, and it took several weeks to recover, and some of it never did. I am a firm believer in alfalfa-raising in Kansas.

COWLEY COUNTY.

Archie Q. Thompson, Rock. — My experience extends over 10 years, and I made several failures (by pasturing too soon) before securing a good stand on 20 acres. The land is largely "gumbo," merging into a stiff clay, and there is a little loam with a clay subsoil. The ground is moist to water, at a depth of 26 to 30 feet. The last week in March or the first of April makes about the best seeding time, after fall plowing, and seed broadcasted, 20 pounds to the acre, and harrowed with a spring-tooth hay rake. During the first season the crop is mowed frequently, but the hay is no object. The full yield is attained the second year, and then there are four cuttings of about one to two tons per acre each. The plant winterkills if pastured too late in the fall. There is no irrigation here, and the "gumbo" seems to be the best soil for the plant, while spouty land is wholly unprofitable for the purpose. The long, deep roots break the hard subsoil in course of time, and thus deepen the soil. Hay is cut when fairly in bloom, and allowed to cure about 60 hours in ordinary drying weather, and stacked in long ricks. If green, it is liable to mold. The total cost in the stack is about \$1.60 a ton. The second crop is considered best for seed, and is harvested, when about four-fifths of the seed is ripe, with a self-delivery reaper, left until dry, and then thrashed with a wheat separator, which cleans the straw but not the seed. The common yield is three to five bushels of seed to the acre, and this is thrashed for \$1 a bushel. For producing beef or milk, to make pigs thrive in winter, and for feeding draft horses, alfalfa hay is very superior, but

for roadsters it is not so good as timothy. The pasturage for swine is superior to any other, and, for cattle, is equal to clover. I weaned 90 shoats in April and put them on a six-acre orchard seeded to alfalfa, giving them also one ear of corn each per day; when nine months old, 70 of them averaged in weight 170 pounds. When alfalfa is damp, cattle should be kept out of the pasture, as they are liable to bloat. Half a teacup of baking soda, dissolved in water, used a drench, is a remedy. The pasturage is profitable and satisfactory for both horses and sheep, and all kinds of stock will eat the thrashed alfalfa hay, while the flowers are excellent for bees.

DICKINSON COUNTY.

Z. W. Coleman, Navarre.—The idea that all grass seed must be sown in the spring has a deep and apparently a lasting hold on the minds of the people. With alfalfa, our experience is, that sown in the spring the plants are weak to begin with, and when the dry, hot weather strikes it, it goes back. A little rain then starts the fall grass and weeds, and the crop is gone. By sowing in the fall, by cold weather the plants are as big as the average spring sown, and are ready for business as soon as the weather is favorable the following spring. The land I especially refer to in what follows is ordinary upland prairie, being a ridge or backbone between two draws, sloping to the south and thoroughly drained. It is underlaid by stiff, heavy-clay "gumbo," in spots, and some stone. My well, at the north end and on the same ridge, is 60 feet deep. In the spring of 1892, I sowed the piece (14 acres) to oats, except a narrow strip on the east side left for a road. This was sown to alfalfa in May. The first week after the oats were off, the ground was prepared, and on the last day of August and the first day of September, 1892, it was drilled (using a common wheat drill set fine) to alfalfa. The seed was run through the hoes, and 6 $\frac{3}{4}$ bushels of seed used, then thoroughly harrowed. A small plat, say one-eighth of an acre, to the west, used as a potato patch, was plowed and harrowed, and sown broadcast, about one peck to the acre of seed used. It all got one good rain right after sowing, then dry till December 6, when a two-foot snow came, and laid on till March 1. Then came the driest and windiest spring we ever had, with practically no rain at all until June 3, when we had a deluge. It rained five times in June, hard enough to put the creeks and ravines out of their banks, and there was practically none afterwards.

Now for results. The spring-sown strip lived through the season of 1892, but yielded nothing. The drilled pieces were put in too deep and altogether too thick. Where it came up the thickest it did the poorest. It came up twice, and the last to come up all died in the fall, both on the drilled and on the broadcast sowings. I began to cut it June 5; I cut the spring sown three times. Could see no practical difference between the spring sown and fall drilled, as to yield, freedom from weeds, stand, etc. Compared with prairie grass on the same grade of land, the product was about the same. On the broadcast fall sowing the stand was better, grew better, and was best all season through. The first cutting of it, about June 10, was a good half crop, compared with alfalfa on same grade of land four years old. Second cutting, about August 1, very light. Third cutting, September 18, made as much per acre as the same grade of prairie land did for the entire season. To sum it all up, I find by sowing in the fall I gain a year in time, and a better and surer stand. I find, also, that I get better results where the plants are four to six inches apart. Any system of seeding that would give a good, healthy plant to four inches square of ground is thick enough, and one-half peck of seed put on well-prepared ground the last week in August of any good, fair wheat year will give plenty of stand. I could not see any practical difference as to ability to stand cold, dry weather, winds, etc., between the young alfalfa and wheat, the grade of land, slope, conditions, etc., being equal.

To farmers who have failed with spring-sown alfalfa I would say: Take a piece of naturally dry, rolling land—it must be clear of standing water at all times of the year, no matter what the subsoil is, or how high above water—put it in good condition and sow to oats. Cut and remove the oats in time so that there will be no volunteer crop; then, as soon as possible, plow and put in good condition again, and whenever your judgment would say to sow, broadcast one-half peck to a peck of good seed per acre, and harrow thoroughly. Pledge yourself that you will keep all and every kind of stock off that land for two years from sowing, and stick to your pledge, and you will find it among the most profitable fields on the farm.

EDWARDS COUNTY.

R. E. Edwards, Kinsley.—I began nine years ago, and now have 800 acres. The soil is a sandy loam, “bottom” and “second-bottom” land, with very little difference in the soil and subsoil, with occasional “gumbo” spots. Well water is found at a depth of from 6 to 14 feet, and the soil to that depth is reasonably moist, except in unusually dry times. I have found it a peculiar crop, having made a failure with very careful preparation of land, and sometimes a grand success with poor preparation. A wet season insures success here, and the time of year for sowing makes little difference. During the first season, if the weeds grow, I mow them, and, if the season is favorable, get from one-half to one ton of hay per acre. I sow from 15 to 20 pounds of seed to the acre. The hay is cut when the plant is nicely in blossom, usually three times a year, and the yield has averaged about four tons per acre per year. Before cutting for seed, the seed bolls should be brown and ripe, and I consider the second cutting the best for this purpose. I cut with a self-rake, and stack without other handling, never raking, and use great care to avoid loss of seed when stacking, after it has cured for from three to six days. The better the stacking the better the hay; but I have never had any so bad that the stock would not eat it all. The cost per ton in the stack for alfalfa is about the same as for other clover. My crop of seed last year averaged six bushels to the acre, and the thrashing and cleaning cost from 50 cents to \$1 per bushel. The common thrasher, with a huller attachment, will do for alfalfa, but a clover huller is better. In feeding farm animals, alfalfa hay is better than clover for any purpose, and is better than timothy for many uses, though I prefer timothy for horses. As pasture for swine, it is worth more than clover; for cattle, it is far better than red clover; as a pasture crop for horses and sheep, it is profitable in the fall and fine for the stock at any time; but in the spring and summer, pasturing injures the crop. Cattle and other animals bloat dangerously on rank alfalfa, especially in the spring and after frost. If ailing animals are discovered, I puncture with a knife. Alfalfa ripened and thrashed for seed differs but little from that cut earlier for hay alone, and cattle eat nearly all of it under any conditions, and thrive. The plant requires from two to four years to attain its best yields, and my oldest stand is as good as any I have. I have not realized the extravagant returns reported by many other parties, but have saved seed for two years past at an average net profit, above all cost of labor, of \$25 per acre each year. For men who understand handling cattle in connection with this crop, \$10 per acre would be a safe estimate for the yearly net profit for a term of years. I do not irrigate.

FINNEY COUNTY.

R. J. Mefford, Garden City.—For any land having a sandy subsoil, like the Arkansas valley, there is no other crop that will do so well, or produce so much value, as alfalfa. I have known a yield of \$45 per acre, on hay and seed, per season. Four cuttings of hay at two tons each, selling for \$3 per ton from the swath, is a yield of \$24 per season, with a very little labor, and I have known 11 bushels of seed per

acre. I have had six years' experience with 300 acres, on "bottom" and "second bottom," with subsoil of sand and gravel, and sandy soil, respectively. Well water is reached at 3 to 10 feet; the "first bottom" is always moist six inches under the surface, and the "second bottom" naturally dry from surface to the water stratum. Generally prefer to sow in the early spring, after danger of frost is past. Have had excellent success sowing on sod the first season, after doing thorough work in preparation of seed bed with discs and harrows. Sowed 20 pounds per acre, and found it best to drill two or three inches deep. When weeds are about matured, cut with mower, and clean off the land. After the first year, there is no particular danger from the frost here. The time to irrigate is immediately after each cutting; flood the land three or four inches deep, and do not allow water to stand on the ground longer than 24 to 36 hours, to avoid scalding the plant. I irrigate from stream, and find that the quantity of water the first year does not differ from that required afterward, as water always increases production. There are three or four cuttings, yielding one to two tons per acre each. Cut for hay when the bloom is brightest, and, if properly cured and stacked, it will keep as well as any other hay. Cut for seed when there are more ripe than green, and there will be more danger in leaving longer than in cutting it; cut with self-raker, and stack when well cured. An ordinary yield is about five bushels per acre. The common thrasher is fairly satisfactory, and the cost for thrashing is \$1 per bushel. The maximum cost of alfalfa in the stack is about \$1 per ton, irrigation costing \$2 per acre. To bale costs \$1.25 per ton, 100-pound bales being preferred. The average selling price has been \$3 per ton, and for seed \$3.50 per bushel. I consider alfalfa much superior to clover or timothy; cattle fatten on it readily, and as a preliminary feed for cattle to be finished on corn, it is unsurpassed. The pasture yield is greater than that of clover, and it is superior for swine; it bloats cattle badly. Irrigation increases the yield greatly, and the feeding quality is not impaired. There must be a subsoil that the roots can penetrate, or else the plant is not very thrifty. Under fair conditions, it attains its best yield after one year, and I find it almost impossible to kill it; so to rid land of it is difficult. Though hard to plow, it makes excellent green manure—equal to clover. The straw makes feed practically as valuable as that cut before ripening.

FORD COUNTY.

John H. Churchill, Dodge City.—Alfalfa is superior to any other feed but grain. My land has paid as high (net) as \$40 per acre yearly—never less than \$25. My four years of experience have been with 100 acres of "second-bottom" land, with loam surface and hardpan and dry clay subsoil. In the lowest places the soil is moist all the way to water, which is found at a depth of from 6 to 12 feet, but in others it is dry for two or three feet. With old ground, as free from weeds as possible, seed 20 pounds per acre, broadcast; harrow in well, and roll; or, seed with drill having alfalfa-seed attachment, 15 pounds per acre. Preferable time for sowing is from March 15 to April 20 or May 1. The best stand I ever secured was sown in the latter part of August, 1890. It bloomed and made good pasture that fall. But that cannot be done every year, as I have missed three times since on that kind of sowing. Spring is the most sure. Cut the weeds when about knee high. Should the season be favorable, cut a light crop of hay September 1, and pasture later in the fall. It does not winterkill here. Have four cuttings, averaging one ton per acre each, without irrigation. Mow for hay on the earliest of the bloom, and for seed when the pods average a rich brown. Heretofore the second cutting has been preferable for seed, but this year the first is. When not too heavy, the hay will cure in 1½ days, and I stack with sweep rakes and stackers. It will not mold if stacked fairly dry, but will heat while going through the sweat. Cut for seed with a self-

rake mower and dropper. An ordinary yield is five bushels per acre. The common thrashing outfit, with clover-huller attachment, does very good work, and the thrashing and cleaning cost 50 cents per bushel. I estimate the total cost of hay in stack as about 75 cents per ton. It is superior to clover and timothy for feeding, and will pasture at least 30 per cent. more stock than clover will. If not irrigated, it is good pasture for horses, as then it is not so washy, and the hay is finer. Animals bloat sometimes, when pastured on rank alfalfa that is wet, or if they get to water soon after eating it. Cattle and sheep should be kept out of the growing alfalfa while it has frost or a heavy dew on, and after hearty grazing on a rank growth should not be allowed to water for several hours. If, however, they are found bloating, stick with a knife or trocar in paunch, on the left side, one span of hand from hip bone. Hay ripened and thrashed for seed is worth about one half as much as that cut earlier for hay alone. On "bottom" lands, the character of the soil does not affect the longevity of the plant. A good yield is attained the second year, under favorable conditions, and it improves every year after that. It will be well to experiment in a limited way on the high prairies having clay subsoil and no irrigation, as the success of alfalfa-growing on the uplands is somewhat problematical.

GRAHAM COUNTY.

A. P. Langley, Morland.—I have four acres of alfalfa, growing four years, but had several years' experience prior to sowing this. The land is "second bottom," both sandy and loamy soil. Well water is found at 18 feet, and the ground is entirely free from hardpan. Ordinarily, in well digging, the soil is found moist all the way down to water. My experience is, that the preferable time to sow is whenever the ground is in the best condition, from April 1 to June 1. The first year's yield amounts to practically nothing, but the ground should be cut over from two to three times, to keep the weeds down, which should be left as a mulch. I do not irrigate. I usually cut twice the second year, and three times each year following. The average yield is $2\frac{1}{2}$ tons per acre. The first and third crops should be cut for hay, and the second for seed; or, if a very favorable season for alfalfa, four crops can be cut. I have never known alfalfa to winterkill. Whenever the pods turn yellow it should be cut for seed, and, in good drying weather, it should be left on the ground probably a half day, or until it wilts, before raking or stacking. If properly cured before stacking, it will not heat or mold, and when stacked out of doors it should be covered (usually with other hay), to prevent the rain from penetrating. I estimate the total cost per ton of my alfalfa, in the stack, at \$1 to \$1.50. My alfalfa yields from 10 to 12 bushels per acre, and the cost for thrashing is from 45 to 50 cents per bushel. Alfalfa hay is worth nearly double any other I ever used. I have seen 100 hogs turned on a field of 12 acres, and taken off before frost, and a good crop harvested. I believe alfalfa a better food, generally, than any other clover that grows. In thrashing, the leaves are shattered off, but stock seem to relish the straw almost as well as that cut earlier for hay. It takes about three or four years to attain its best yields. It is my fear that alfalfa will never be a great success on the high prairies, yet I believe it is going to bring northwest Kansas to the front, as it can be raised on low ground with little or no rainfall, and for all uses it is one of the best crops grown. I know of several instances where farmers have almost made a fortune by raising hogs on alfalfa, and by selling the seed. I am satisfied that all farmers who have low ground can do much the same.

GREENWOOD COUNTY.

F. G. Thrall, Thrall.—I have had 10 years' experience with alfalfa, and now have 50 acres. The land is "bottom," with surface and subsoil of loam. By digging 10 to 20 feet we reach well water. After deep plowing and harrowing, one-half bushel

of seed is sown to the acre, and harrowed in with a common tooth harrow. April is the preferred month for seeding. During the first season I keep the weeds cut, and, if the season is good, have one fair crop of hay. After the first year, unless the alfalfa is pastured too late in the spring, I cut four crops of hay, averaging $1\frac{1}{2}$ to 2 tons per acre. The plant is not particularly liable to winterkill. For hay, I cut when in full bloom, and, the day after cutting, rake up and shock, to cure two or three days. I stack in large ricks, and fill my barn. If properly cured it keeps well. The estimated cost of the alfalfa in the stack is about \$2.50 per ton. For feeding farm animals, one ton of alfalfa hay is worth two of timothy or clover. As pasturage for swine or cattle, it is worth twice what red clover is. I have pastured horses and cattle on it in all stages of growth, but have never had any stock bloat. Alfalfa seems to attain to its best yields three or four years after seeding, and the older it gets the better it becomes; so that on good land it needs no reseeding. I consider it the best and most profitable crop I can raise here. It makes the best hay, since stock will fatten on it alone; it makes the best pasture, and the most of it; and, when a farmer gets a good stand, it is a permanent crop, as it does not freeze out, and hogs cannot root it out.

GOVE COUNTY.

H. C. Williams, Grainfield.—Have had eight years' experience in alfalfa-growing; now have 50 acres; it is on all kinds of land, but the "bottom" and "second bottom," and sandy soil do the best. Most of the subsoil is sandy, and the crop does not do well where there is hardpan. It is necessary to dig 3 to 26 feet for well water. I plow deep, in the fall, disc and harrow well in the spring, sow in April, 15 pounds good seed per acre, about two inches deep. Sow one-half bushel of barley per acre with it, to keep down the weeds, and sometimes cut a hay crop in the fall, but get no seed the first year. It does not winterkill here. After the first year, cut about June 1 for hay, August 1 for seed, and September 15 for hay. Mow when in bloom for hay, and let cure 6 to 12 hours. Stacks covered with prairie hay will not heat nor mold in this climate. When most of the pods are brown, cut for seed, put into cocks as soon as possible, and thrash when dry. Have raised eight bushels of seed per acre, but the average yield is about five. Thrashing and cleaning cost 75 cents per bushel, and I consider the clover huller the best thrasher. In 1890, I had three acres, from which I cut 21 tons of hay and thrashed 25 bushels of seed. Alfalfa hay is better than any other that I know of; the pasturage is good for horses, and for cattle it is one-third better than red clover. Sheep and cattle sometimes bloat, and the only remedy I know of is to stick them. Hay grown without irrigation is more valuable as feed than that irrigated. If properly used, the straw is about as valuable as the hay cut earlier. After one year from seeding, the crop yields well here, and gets better every year so far. It is the best crop for bottom lands in western Kansas, but I would not advise anyone to sow on upland, unless in sandy soil.

HAMILTON COUNTY.

Thos. H. Ford, Syracuse.—I have grown alfalfa for five years, and have 300 acres. The land is "first" and "second bottom," with some black loam and some very sandy soil. The black loam has a clay subsoil, and the other is all sand. To reach well water it is necessary to dig 6 to 15 feet. The soil is all made moist by irrigation, but after the second year this is not necessary, as the alfalfa roots go to water. We prepare the land just the same as for clover or timothy, and sow 15 pounds to the acre, broadcast, with seeder. We prefer to sow in April, but have good results from sowing in September, in which case it comes up in the spring before the weeds do. After the spring sowing, the first crop hardly pays for cutting as hay, on account of the weeds, but should be cut by the middle of July, and the weeds will

give no more trouble. The plant is not liable to winterkill. We irrigate after each cutting, running the water over the crop as soon as possible, except in the case of ripening for seed, when no irrigation is used, when the plants grow rank, producing less seed and more straw. A part of the land is irrigated by a ditch, built from the river, and the remainder by an irrigation pump, which is set in the creek, and raises the water 12 feet. The pump is the "Menge," made at New Orleans, and throws 150,000 gallons per hour. If we irrigate well the first summer and fall, there is not half so much water required the next season. We have cut four crops each season, with 2 to 2½ tons to the acre at each cutting. The hay is cut when in full bloom, with a "McCormick" self-rake, then raked off in windrows, cocked, and allowed to stand 1½ to 2 days before stacking, or three days before thrashing. For hay, it is better to rake a half day after mowing and allow the alfalfa to cure in the cock, thus saving all the leaves. For seed, the hay is cut when the pods are all black, or dark brown. The second crop is best for this purpose, although we allow part of the first crop to go to seed, with good results. In stacking, I use a double-harpoon hay fork. I never had any alfalfa spoil in the stack. One dollar per ton covers all expense in the stack, and land is worth \$15 to \$20 per acre. My seed crop netted me over \$35 per acre, and I had two crops of hay besides. The yield of seed is 5 to 13 bushels per acre. The ordinary thrashing outfit is not satisfactory, and we use the "Birdsell" clover huller. The cost of thrashing is 50 cents per bushel.

Alfalfa hay is far better than clover for all kinds of stock, and I have fattened cattle on it in the winter just as fat as I ever did in Iowa on corn. Our hogs are all fattened on alfalfa, as we raise no corn. As a pasture crop for horses and sheep it is satisfactory and profitable, and it is far better than red clover for cattle, pasturing double the number of stock. As to bloating, it acts the same way that clover does. If stock stand for 12 to 15 hours with nothing to eat, and then break into the alfalfa, they bloat in five minutes. We stick them on the left side. There is a difference of \$1.50 per ton between the hay ripened and thrashed for seed and that cut for hay alone, and this is because the former is harder to handle. The best results are attained after the second year. Constant irrigation makes our ground hard, so we cut it up in the spring with the disc harrow, and that makes it as good as before. On high prairies, with clay subsoil, and no irrigation, alfalfa is not a profitable crop; but if we could irrigate our upland, and put in alfalfa, every acre would be worth \$40. Last year I saved 70 acres of the first crop for seed, thrashed 565 bushels, and sold it for \$4.75 per bushel. I can make more money on my land by farming it in alfalfa than can be made on any other land in the United States with other crops.

JEWELL COUNTY.

W. S. Chapman, Mankato.—Most assuredly I consider alfalfa a reliable and profitable crop for the high prairies with clay subsoil and no irrigation. The last two seasons have fully tested it. I regard it as the best crop we can produce in this part of the country, and intend to increase my acreage as rapidly as possible. We have cut fair crops on upland this year and last, making three cuttings in the season. More moisture would have been decidedly beneficial in increased yield, yet, notwithstanding our extreme dry weather, we have abundance of good feed, while almost all other crops are complete failures. My land is upland, with very stiff clay subsoil, and some few small spots of "gumbo." As a rule, except in an unusually dry time, the subsoil is moist close to the surface, and well water is reached at depths of 30 to 90 feet. Prefer to seed in the spring, as soon as safe from frost, after plowing to good depth and putting soil in best possible condition. I sow about 15 pounds of choice seed per acre with a drill, about two inches deep, and then, if the ground

is dry and light, using a heavy roller. During the summer I mow the weeds twice and leave them on the ground as a protection, unless the alfalfa is very vigorous; then save the second cutting for hay. Unless in low places where water stands, it does not winterkill here. Each year after the first, there are three cuttings, yielding about one ton per acre each. Cut for hay as the plant is coming into bloom; when partly cured it is raked, and then left in the cock for three days before stacking. I prefer hay sheds with well-built roofs and ends, but open sides. It makes very little difference which crop is used for seed, aside from the conditions under which it matures. Cut with harvester or self-binder, the same as grain, and protect from rain. On land valued at \$25 per acre, the total cost of alfalfa in the stack, here, is about \$1.25 per ton. Seed has sold for \$4 to \$5 per bushel. For feeding, the hay is fully as good or better than clover or timothy; pasturage, for hogs, horses, and cattle, compares favorably with clover, and is, in fact, better for cattle. When turned in on wet alfalfa, or when it is in bloom, cattle that are very hungry are liable to bloat.

KEARNY COUNTY.

A. R. Downing, Deerfield.—Experience eight years, with 60 acres of alfalfa; upland, with open soil for several feet down, a little sand, and no hardpan; 50 feet to water; soil dry from top to within three or four feet of water. By way of preparation, a good seed bed suitable for any small grain; broadcast 15 to 20 pounds of seed to acre, and harrow twice; or, if ground is dry, drill with press drill. Middle of April is preferred for sowing, but any time will do after that to August 15. If sown in spring, mow weeds and alfalfa about middle of July. A good crop of hay, one ton or more per acre, can be cut the second time. Unless the growth is very good, it is not safe to leave for seed on account of other seed getting with it. It does not winterkill here at all. We irrigate once for each crop, as early as possible in the spring and after cutting; the water should be run on from three to six hours, and a whole day or night does not hurt it. The water is obtained from the Arkansas river. Old and new alfalfa require about the same treatment—the more water the more hay. I always cut three and often four crops after the first year, with an average, each cutting, of about $1\frac{1}{2}$ tons per acre. Cut for hay when about half in bloom, and for seed when the greater number of pods are black or brown; preferably of the second crop. For hay, cut with self-rake, cock as fast as cut, and stack as soon as dry. Hay should be cocked as soon as it can be raked, as the leaves are saved and the color kept better by curing in the cock. Hay should be dry when stacked, or it will heat; if stacking is followed by damp weather, the stacks should be covered. Total estimated cost of hay in stack is \$1.25 per ton. Cost of baling a ton in 100-pound bales is \$2. The size of a bale does not affect keeping qualities. Ordinary yield of seed is five bushels; cost of thrashing and cleaning, 75 cents. Most prefer a clover huller to the ordinary thrasher, as it leaves the straw in better condition.

Alfalfa hay is much better for all kinds of stock than clover or timothy; cattle get fat on it, and but little grain is needed with it for work horses. As pasture feed it is equal to clover, and the yield of one acre of alfalfa watered is equal to three of clover. For five years, I have demonstrated the fact that 20 hogs will thrive on one acre of alfalfa if it is kept moist. It is satisfactory and profitable pasture for horses and sheep, but not safe for cattle, as the loss from bloat is so great that few care to take the risk. A stick tied in the mouth as a bridle bit is a good preventive, the knife being the only cure for bad cases. Hay well matured is always best for work horses, being less washy. The market value of the straw is half that of hay, while its feeding value is fully two-thirds. As to yield, I can see no difference between the second year and the ninth, and my opinion is, that alfalfa well cared for will do well for 20 years or longer. It is hard to plow up; a sharp plow lessens the difficulty.

Plowed under for green manure, I think it as good as red clover. I have no faith in alfalfa outside of irrigation, except where water is four to eight feet from the surface; it is a plant that requires much water, and it roots so deep that an ordinary good rain seems to do it but little good. I consider it the best all-around feed grown. I thrashed last season eight bushels per acre, and sold for \$4.65 per bushel. It will bring on an average, seed and hay, \$20 per acre. I am seeding more every year, and shall not be satisfied until I can show 300 out of 480 acres in alfalfa. My observation is, that the farmers who have the most alfalfa are the ones who have the largest bank accounts. It is certainly king in western Kansas.

LANE COUNTY.

D. E. Bradstreet, Dighton.—I began seven years ago, and now have 30 acres. The land is "bottom" and "second bottom," with loam surface and dark, porous subsoil. On the "bottom," well water is reached at six feet, and even, in the driest time, the soil is moist below eight inches. In my opinion, backsetting new land is the best method for starting alfalfa. We sow 25 to 30 pounds of seed to the acre, broadcast, and harrow well. Without irrigation, seed can be sown here about the first of April. I sow with barley or oats, and harvest so as to leave plenty of stubble for winter protection, but do not cut alfalfa at all the first season. It is not liable to winterkill, but some such protection is beneficial. After the first season, we cut three times, obtaining $1\frac{1}{2}$ tons per acre at each cutting. Hay is cut when the plants are fully in bloom, and, after curing about one day, is stacked like prairie hay. If properly cured, there is no particular danger of molding or heating. For seed, I wait until the seed is about two-thirds ripe, then mow, rake and thrash with the ordinary thrashing outfit. Ordinarily, alfalfa will yield 6 to 10 bushels of seed to the acre, and this costs, for thrashing and cleaning, 50 cents per bushel. As food for farm animals, alfalfa hay is of about the same value as clover or timothy. There could be no better pasture for horses and sheep, while for swine and cattle, alfalfa is equal to clover. About 15 hogs can be pastured on an acre, but if mowed for them, an acre is sufficient for 30, since it grows so much faster if not tramped over. In the spring, there is danger of bloating, if animals are pastured on rank alfalfa. The time in the pasture should be gradually increased at first, and during the summer there will be little danger. Ripe alfalfa thrashed for seed is of about half the value of that cut for hay alone. Our greatest difficulty in alfalfa-growing is in getting a start, but I have failed only one season out of seven. It is a paying crop for Kansas, especially in the "bottoms" of the western part of the state. I have wintered and summered 40 hogs this year principally on alfalfa, and they are thrifty. It is the best milk producer I have ever seen. Everything eats it, even the fowls, and I think a man could make money raising geese on alfalfa. Last year, I thrashed 104 bushels of seed from 10 acres, and sold it at \$4.80 per bushel, besides having two cuttings of hay yielding about $2\frac{1}{2}$ tons to the acre.

LINCOLN COUNTY.

D. B. Day, Lincoln.—I sowed eight acres of alfalfa five years ago, and now have 18 acres. on creek "bottom," sandy loam, with clay below the first two feet, and well water at a depth of 20 feet. I prepare the ground as for wheat, and have always sowed broadcast, about 20 pounds per acre, and harrowed lightly. I think if put in with drill, eight pounds would be enough, drilling four pounds each way. The first of April or first of May is a good time to sow. Mow when the weeds are about six inches high, and rake them off if thick; mow twice afterward, the last cutting making good hay. If the plant gets a good start in the summer, there is little danger here from frost. I cut first for hay (after first year), obtaining about $1\frac{1}{2}$ tons per acre; then for seed, and again for hay, obtaining about one ton. For hay, I mow

as soon as fairly in bloom, and for seed when the pods brown. Let hay lie 24 hours before raking, then put in barn or stack, and top out with sorghum or prairie hay, as it does not turn water very well. With land valued at \$20 per acre, the cost per ton of alfalfa in the stack is about \$1. Thrashing and cleaning costs about \$1 per bushel, and a clover huller is best for this. Alfalfa hay is about equal in value to clover or timothy. For hogs, as hay and as pasturage, it is better than clover; with plenty of rain, I think four acres would give 100 hogs all they could eat. They will do better the first six months than on corn, with one-quarter the cost.

MARION COUNTY.

Thos. M. Potter, Peabody.—Have had about six years' experience with from 5 to 100 acres. The soil is alluvial "bottom," mostly black for 12 inches, and shading into a yellow clay as it grows deeper. Well water is reached at a depth of 20 feet. The best preparation here is fall plowing, with a thorough pulverization of the surface only in the spring. Sow in the spring, after vegetation has started well and danger of frost is past, 22 pounds of seed per acre, broadcast or with press drill, about two inches deep. After the alfalfa has a good start, mow the weeds. Must be governed by the season and the condition of the ground as to when and how often to mow. Have obtained from one-half to one ton of hay and weeds per acre the first season. It does not winterkill here. After the first year, there are three crops, averaging about one ton at each cutting. For hay, cut when about two-thirds in bloom; let stand two to six hours, rake, and let stand about 24 hours in the best curing weather, and then stack, in any kind of stack that suits convenience and machinery. If properly cured, it is not liable to mold. When the majority of seed bolls are ripe, cut for seed, with a self-rake, and stack when dry. An ordinary yield is $2\frac{1}{2}$ bushels of seed per acre, and the cost of thrashing is \$1 per bushel; the ordinary thrasher needs a clover attachment. Estimated cost of hay in the stack is about \$2.50 per ton. Baling costs \$2 per ton. The size of bales makes no difference as to keeping; bales weighing 80 to 100 pounds are most common. The food value per ton is about equal to that of clover, but the yield per acre is double. I am satisfied, from an extended observation in Kansas and Colorado, that hogs on alfalfa pasture need a little grain to do best, especially if one expects to fatten them. Alfalfa is excellent for horse and sheep pasture, and for cattle I consider it worth twice as much as red clover, acre for acre. The straw is about one-third the value of the hay. At the third year from seeding, the yield is at its maximum. I am doubtful of this crop succeeding on high prairie having a clay subsoil.

MEADE COUNTY.

R. E. Steele, Meade.—I commenced growing alfalfa in 1885 with 40 acres, and now have 400, on "bottom" and "second bottom," with sandy loam soil one to three feet deep, and the subsoil of sand, with a few spots of clay. To a depth of one or two feet, the soil sometimes becomes hard; but below that it is moist, and water is reached at a depth of 6 to 10 feet. I prefer to sow in the early spring, between the 1st and 15th of April, on land prepared as for wheat. After filling up the low places with a leveler, I seed with press drill, about two inches deep, 10 to 12 pounds of seed to the acre. When sown broadcast, 20 pounds to the acre is not too much. The weeds are cut in July, before they become hard, and after that there is good fall grazing; but I have never saved hay or seed the first season. I irrigate two or three times a year, as soon as each crop is removed, with water from a creek which furnishes about 1,200 gallons a minute. The first time land is irrigated it requires twice the quantity ever needed again. My estimate is, that we must use about 125,000 gallons per acre, at each irrigation. Much of this quantity is wasted by running into gopher and other holes, sometimes reappearing a mile away, in a flowing

well. The weather and water are both too cold for irrigation in April and May, and the water rather retards than promotes growth. Fall irrigation, winter snows and spring rains obviate the necessity of supplying water for the first crop. When seed is desired of the second crop, which is usually the choice for that purpose, results are most satisfactory if only rain is depended on for moisture, as too much water produces such a rank growth that none but the blooms on the extreme tips of the plant mature. The second year after seeding, the plant is at its best, and, on sandy loam, it lives forever, though in clay it is short-lived. There are three or four crops a year, yielding from one to two tons per acre each. When in full bloom the hay is cut, and it should stand in the windrow or cock until dry; in June, it requires a week; but in July or August, hot winds will cure it in a day. I put in stacks 15 feet wide, 10 feet high (to square), and as long as desirable. If dry, it keeps well. With \$50 valuation per acre of land, the alfalfa in the stack costs \$2 a ton, and, in the local market, it has sold for several years at \$5 a ton. Seed is harvested when most of the pods are brown, cut with a mowing machine, raked as soon as cut, and stacked with as little handling as possible. The ordinary thrashing outfit, in ordinary hands, is not satisfactory for this crop; but a good separator, well managed, saves all the seed. An average yield for the past six years is five bushels to the acre, and the average price of it has been \$5 per bushel. The straw is worth about one-fourth as much as the hay. Alfalfa hay will fatten horses and cattle, and, for this purpose, is almost equal to corn. The pasture is the best I know of for horses. Cattle on the pasture bloat badly in the spring. To rid the land of it requires a team and plow strong enough to plow hazel brush, in the summer. On the uplands, in this county, alfalfa will grow only when irrigated.

NORTON COUNTY.

C. D. Bieber, Calvert.—I have 43 acres of alfalfa, and my experience extends over 12 years. The soil is "second-bottom" loam, and some of the soil has washed off to the subsoil, which is "gumbo" to the depth of three feet, below which is a magnesia limestone hardpan, three feet deep. Dig 40 feet for well water, through soil which is dry for about three to five feet, beginning four feet below the surface. I find that it is best to plow at least two inches deeper than usual, in order to break the crust that forms under the plowed soil; then harrow well before sowing, 20 pounds per acre, and harrow again lightly, to cover the seed not more than two inches deep. About the first of April is preferred for seeding. I cut the weeds once or twice, as required, and seldom fail to get a clean crop of hay—about 1½ tons per acre—the first season. It has winterkilled for me but once, and then to no great extent. After the first year, there are three crops of hay, or one each of hay and seed, with fall pasture. Hay is cut when the first blossoms form pods, and seed when the majority of them are ripe, the crop chosen for seed depending on the season. I invariably cut hay in the morning, and stack in the afternoon, and have no trouble with mold or heat, if there is no dew on the hay when put in the stack or barn. An ordinary yield of seed from one cutting is four bushels, but when wanted to sell there can be two crops of seed. The cost for thrashing has been 40 cents per bushel of 60 pounds. In my judgment, alfalfa excels both clover and timothy for feeding farm animals. It will not stand pasturing in the spring, nor in dry weather, and so, as regards the plant, it is not so good as red clover, while it is better than the clover for cattle feeding. I have had no animals bloat, and have pastured at all stages of growth and all seasons. Alfalfa straw is as good as the hay, and for horses it is better, since it is not so washy. The plant reaches its best yields about the fourth year, and I have some that is just as vigorous as it was eight years ago.

OSBORNE COUNTY.

Jerry Quigley, Pleasant Plain.—Alfalfa is a good paying crop for hay, seed, and pasture, on good, level upland, and I consider it the most profitable that can be grown in western Kansas, more especially for hog pasture. My experience extends over eight years, with 18 acres. This is part upland, with stiff clay subsoil, and water at depth of 40 feet; part "bottom," with a rich, dark soil, and water at 15 feet. Dry soil begins at top and extends down to within five or six feet of water. Plow deep, harrow once, seed 20 pounds per acre, harrow twice, and roll with heavy roller. I have sown the last of March with success, and others here have had as good results from seeding the last of August or first of September. When the weeds are six or eight inches high, mow, and let lie on ground. The last of August, I cut for hay, but get no seed until the second crop of the second year. At first cutting of second year, I get one ton of hay on upland, and 1½ tons on bottom; the second crop yields two bushels of seed per acre. There can be three cuttings for hay, and good fall pasture. Hay is cut just as it begins to bloom, allowed to cure 36 hours before raking, and then 48 hours before stacking in ricks or round stacks, topped with material that turns water well. It is liable to mold and heat. Cut for seed when the majority of pods are black and others turning yellow, handling like any other grain crop; but I prefer thrashing out of the field, and from the second crop. The total cost of the alfalfa in the stack is about \$1.30 per ton. My average yield of seed has been two bushels per acre. Thrashing and cleaning costs \$1 per bushel, and the common machine saves not more than half the seed. Some of my neighbors have thrashed five bushels of seed per acre. I consider the hay better than timothy for horses and cattle, and it is extra good for milch cows. One acre, on good soil, will pasture 10 head of hogs (from 80 pounds upwards), and keep them in good growing condition. The pasture is excellent for horses, but the hay is not considered good for driving and coach horses, though it is for draft horses. Hogs can be wintered well on the hay, which, for them, should be cut while young and tender, before it begins to bloom. Green alfalfa will go twice as far for swine if cut every morning and put in the hog lot, as long-continued pasturing makes the ground too hard for the best growth of the plant. My stand is eight years old, and is as good as ever. The straw is worth about half as much as the hay.

POTTAWATOMIE COUNTY.

Peter Noll, Myers Valley.—I have been raising alfalfa eight years, averaging about 30 acres, on upland and loam, with a subsoil of yellow clay and limestone. Have to go about 50 feet for water, through loam, slate, and limestone. To prepare ground, plow in the fall; sow 15 to 20 pounds of seed per acre, four inches deep, with a press drill, any time in April or May. During the first year it should be cut and allowed to lie on the ground. We do not irrigate, and have no trouble from winterkilling, if hogs allowed to run on it are ringed. We cut for hay when in bloom, and use the second crop for seed, cutting with a side-delivery machine. Cut for hay, it should be allowed to cure until it begins to turn yellow; then rake into windrows, and before it colors in the windrows, bunch it; stack in stacks eight feet wide, height to suit, topping out with millet or corn fodder. The ordinary yield is two bushels of seed per acre. The cost of thrashing and cleaning is \$1 per bushel. Alfalfa is considered worth about 50 per cent. more than timothy or clover for general feeding; for pasturing hogs, it is worth nearly double red clover. I have kept 100 hogs on five acres of alfalfa pasture. When cattle are allowed to run on alfalfa from the time they are calves, they will not be affected by bloat. The straw is worth about half as much for feeding as the hay. The crop is about its best here the second year after sowing. No trouble in ridding the ground of alfalfa when so desired. Western Kansas

cannot do better than to raise alfalfa. I have pastured, all summer, every year for five years, 150 hogs, with early spring and late fall pasture for 50 head of horses and cattle, besides getting 30 bushels of seed and 40 tons of hay each year, from 30 acres.

RAWLINS COUNTY.

M. A. Wilson, Atwood.—About seven years ago I began, and have steadily increased to 100 acres, on "first" and "second bottom," with loam soil, not sandy, but of an emery nature, and with a fine emery clay subsoil. On the "first bottom," water is reached by digging 10 feet through soil moist all the way; on "second bottom" it is necessary to dig 17 feet, and there is a dry streak four feet thick, beginning about two feet from the surface. Have ground in good cultivation, plow deep, in the fall, if wet enough; sow seed broadcast early in the spring, about one-half bushel per acre, harrow thoroughly, making ground level, and then roll. When alfalfa and weeds are well up, cut and leave equally distributed over the ground, repeating as often as needed during the first year; rake and haul off the next spring, then renew in any thin spots, and harrow all over well. In a dry altitude there is no particular danger from frost. Three cuttings of hay per season yield about four tons; when seed is ripened once there are only two cuttings. The first cutting is preferable for seed, which should be mowed when nearly all the pods are brown, and stacked in ricks as green as it will keep. Hay is cut when the field is in full bloom, cured one-half to three-quarters of a day, and put in large ricks out of doors; unless green it will not mold. Estimated cost of hay in the stack is about \$1.25 to \$1.50 per ton. The yield of seed is 3 to 10 bushels per acre; cleaning and thrashing costs about 75 cents per bushel, and the average selling price has been about 10 cents per pound. An ordinary thrasher in most cases gives fair satisfaction, but a clover attachment is better. The hay is at least one-fourth better than clover or timothy for fattening qualities, and horses are not affected with heaves as they are on timothy. For pasturing hogs, it is at least 50 per cent. better than clover; 10 or 12 hogs can run on it from April 1 to November 1; if the hay is mowed and fed, it will be sufficient for 40 head. I let my hogs run in the field and feed corn out of a self-feeder; they eat about one-half as much corn as they would if kept in pen, and gain about 1½ pounds per day, if they have plenty of good water. It is good for horses, and for cattle is 50 per cent. better than clover. The straw is of about two-thirds the value of hay for feeding. I had 14 acres in the dry year of 1890, which yielded about \$800 profit in hay, seed, and pasturage. I did not irrigate.

RENO COUNTY.

J. B. Brown, Hutchinson.—Six years ago, I sowed 120 acres of alfalfa, and this year 300 acres more. The land is partly "bottom," and upland, with sandy loam, and clay subsoil. Water is found about 10 feet down. Any time in the month of April is good for sowing, and May is all right. I plow the land well, harrow it, and then let it settle for a few days. Have sown 18 to 20 pounds of seed per acre, broadcast, with grass-seed sower, and then harrowed well. On old or foul ground, I think it necessary to mow the weeds at least twice during the first season. Alfalfa sowed on new ground, in April, has cut for hay this season 1½ tons per acre. I mow three times, after the first year, for hay, or once for hay and once for seed. Cut for hay as soon after the blossoms fall as possible, and for seed when most of the bolls are ripe, preferably of the second crop. I have mowed for the seed crop with a common mower; raked in windrows soon after cutting, and thrashed it in about a week. Hay cures in one or two days, and I have had no trouble with molding or heating. I estimate the cost of alfalfa in the stack as about \$1 per ton. The yield of seed is five to seven bushels per acre, and the cost for thrashing and cleaning is about 75 cents per bushel. I use the ordinary thrashing outfit. The hay I consider

worth twice the price of prairie hay. For farm animals, I consider alfalfa hay much richer food than either clover or timothy, and it is much richer pasturage for hogs. One acre of good alfalfa will pasture 10 head of hogs, and they will keep in good stock condition without grain. It is profitable pasture for horses and for cattle; I prefer it to red clover or timothy. Have no cases of bloating. The alfalfa straw is much better than prairie hay. After the second year, the alfalfa is best, and I have some sown six years ago which is good yet. Bottom lands will produce much more hay or seed in a dry year than will uplands, but I find some good alfalfa on the uplands. It is the best crop grown in this part of Kansas. I have known it to make \$60 per acre, in one season, from the hay and seed crops.

RICE COUNTY.

C. K. Beckett, Raymond.—I had four years' experience with 25 acres of alfalfa, without irrigation, grown on "bottom" and "second bottom." The surface is sandy loam, and the subsoil sandy and clay, with some "gumbo" on the heavy land. All that I sowed on the "bottom" died after two years, as it was too near the water. By digging four to eight feet water is reached, and the soil is moist all the way. I plow deep and harrow well; sow 20 pounds per acre. Have also drilled some, and like that method. Seed should be covered 1 or 1½ inches—not over 2. Preferable time for sowing here is from 1st to 20th of April. I keep mowing the weeds off, and leave on the ground, while small. As soon as in bloom the hay should be cut, and it must be well cured before it is stacked or put in barn; two to four hours is sufficient time to let stand before raking, and it cures in the cock. The second crop is best for seed. Cut with a header, drop in piles, and thrash as soon as cured. Land, before it is set to alfalfa, is valued at \$20 per acre, and the estimated cost of the hay in stack is \$1.50. One ton of alfalfa hay has more strength than two tons of clover or timothy. For pasturing swine, it is worth three times as much as clover, and will feed twice as many cattle; is also fine for horses. I had 30 sows raise 150 pigs this year on 1½ acres. Now (September) the 150 pigs are running on it and it keeps ahead of them. My alfalfa has grown better every year, except where too near the water. I think the straw equally as good as the hay cut earlier.

RUSH COUNTY.

B. F. Coughenour, La Crosse.—My experience with alfalfa extends over six years, on from 10 to 40 acres of upland loam with hard clay subsoil, with well water at a depth of 40 feet. Deep plowing is good preparation for seeding, and subsoiling would be an advantage. Sow 25 pounds to the acre, broadcast, harrow, and cross harrow, and then roll the ground well. Preferred time for seeding here is from middle to last of April. If on old and weedy ground, it is well to set the sickle bar high and cut weeds before maturity, leaving for mulch. In a wet season there may be another cutting. No danger of winterkilling here. After the first season, there are two or three cuttings a year, depending on the rainfall, yielding about one ton to the acre each. When bloom is matured, cut for hay, raking in the evening of the same day. Stack in long ricks. It is liable to mold if put in too green. For cows, I prefer alfalfa hay to either timothy or clover; for horses, it is as good as clover, but not as good as timothy. As pasturage for swine, I consider it about equal to clover. It makes fine pasturage for horses, and for cattle it is much better than red clover. I think it the best crop for pasture and hay that we can raise, and would recommend that every farmer have from 10 to 30 acres sown along "draws" or on depressed land. It will pay. Ten acres of alfalfa will keep 100 hogs, and make more money than anything else that I know of in the farming line.

RUSSELL COUNTY.

Thomas Sutton, Russell.—Have seven years' experience on from 60 to 300 acres of "first" and "second bottom" land, with sandy loam surface. The subsoil is, in some places, like the surface for several feet; some sandy, and some a little clayey. Well water is found at a depth of 35 feet, and most frequently in the two years past, in this county, the soil has been found to become drier as we went down, until the water was reached. Corn land, listed, was left very clean in the fall, and cleaned off in March and April; seeded with hoe drill, 10 to 12 pounds to the acre. Seeding may be done here from April to August, if the rainfall is sufficient. Cut in May, as a cultivation and to destroy the weeds; six weeks to two months later, cut for hay. If the ground is moist, there may be two hay crops, giving $1\frac{1}{2}$ tons per acre for the season. It does not winterkill here. There are three cuttings each season after the first, and, if very wet, four. For cattle it is cut when in full bloom, and for horses when going out of bloom. I rake in windrows after the machine, when hot enough to wilt the leaves, cock, and let cure in the cocks. Stack about six tons in the stack, and never had any spoil or lose leaves or color. The ordinary yield of seed here is two to four bushels, and the thrashing costs \$1 per acre. We have nothing but the wheat thrashing machines, but an honest, capable man can clean the straw and seed well with them. For farm animals, timothy and clover will not compare with the alfalfa hay. In past years I pastured cattle and made fine gains, but lost the stand to weeds; never had a case of bloat. I keep swine on it in summer, and on hay in winter, and am not ashamed to show them at any time. It pastures about 10 hogs to the acre, if cut once or twice during the season. In Colorado, the preventive of bloat is to keep the cattle off the pasture, and I infer that the irrigated alfalfa differs from that not irrigated, in causing the bloat. The thrashed straw is eaten entire, with relish. There is no difficulty in ridding land of the plant, and it is good green manure when plowed under. The crop is better than any other known in western Kansas, on any of its soils or elevations. The ground must be clean for two years prior to sowing to alfalfa; on old ground the seed must be drilled, 15, better 10, pounds per acre. On fresh breaking, 20 to 25 pounds are needed; break the sod so that it lies flat; do not disc or harrow the first year; early the second spring, disc, and sow broadcast, to suit the stand you wish.

SEDGWICK COUNTY.

Edmund S. Carlisle, Mount Hope.—Eight years' experience, and have 200 acres on "bottom" and "second-bottom" land, with sandy and loam soil, and subsoil much the same, with spots of hardpan of various sizes. The soil is generally moist for five feet down (as far as I have dug), and water is found on the "bottom" at 12 feet, and on the "second bottom" at 36 feet. I do not irrigate. The land is prepared as for garden, as clean as possible from weeds, and with a good seed bed, and seeded 20 to 30 pounds to the acre, two or three inches deep. I sow broadcast, and harrow or broad cast in front of an empty drill and press behind. It is well to seed about the first week in April, as soon as the frost is gone and moisture and warmth assured; or else between the rows, at the last cultivation of corn. During the first summer it should be mowed frequently enough to keep the weeds from going to seed, and raked off or left on the ground according to the dry or wet state of the weather. If pastured too close in the fall, there is danger of winterkilling, in case of dry cold without snow. Sufficient stubble should be left to hold snow, as there should be protection for the crown of the roots. Mine has been regularly cut for seven years—first crop during the first week in June; the second (for hay), July 10; or for seed, August 10; and the third for hay, about the middle of September. The general yield has been 3,000 pounds of green hay to the acre, except for the third

cutting, which gives only two-thirds of that. (I assume that hay shrinks one-third in drying in the stack.) For hay, I cut when well in bloom and when the leaves are beginning to fall off the stem; for seed, it is desirable to cut when there is nearest an average ripeness, as it ripens very unevenly.

I prefer the second cutting for seed, and mow with an old-fashioned self-dumper, as raking causes a great loss of seed. When it is fairly dry, it should be stacked with as little handling as possible, and will ordinarily yield three to four bushels per acre. The common wheat separator is not satisfactory; a clover huller is needed, although a huller attachment to a common thrasher makes a great improvement. The cost of thrashing is \$1 per bushel, including board of outfit, and of cleaning at 10 cents, and in the last three years the selling price of seed has been \$5 to \$7 a bushel. Hay should be raked 24 hours after mowing, or when wilted, and put in good-sized cocks for seven or eight days, and then stacked under cover if possible; otherwise, have a thick, heavy top of prairie grass. If it is dry and well cured when stacked, and the rain is kept off, it will not heat nor mold to hurt. Alfalfa hay is always worth twice as much as prairie hay. The straw makes good feed for cows, but horses do not like it or do well on it, and it is decidedly inferior to the early or late hay. My alfalfa land has returned me a yearly net average per acre of \$28 for the past four years, in seed, hay, and grazing, thus: First cutting of hay, when dry, one ton, \$6; second cutting, for seed, $3\frac{1}{2}$ bushels, at \$5, \$17.50; third cutting, for hay, dry, two-thirds ton, \$4, with grazing in early spring and late fall. The third cutting is the finest hay, and always worth more than the first, especially for horses. I have been successful in pasturing 10 spring pigs and their mothers on one acre of alfalfa, with 10 pounds of corn per day to each sow and her litter of pigs, selling the brood sows in August, and finishing the pigs on the same field, feeding five pounds of corn per day to them, with an average increase of one pound a day from birth. For horses, the pasture is most excellent. In time of heavy rains or very heavy dews, there is danger to cattle from bloating, and they should be kept away from it until the extreme dampness has dried off. My alfalfa continues to stool out for four or five years; was at its best the third year, and continued vigorous five years or more, needing light reseeding the eighth year, say 10 pounds to the acre.

THOMAS COUNTY.

Henry T. Knudson, Colby.—Seven years ago I began with five acres, and have increased to 35. My land is "second bottom" with loam soil, containing alkali, and the subsoil, except occasional spots of hardpan, is quicksand, which becomes very hard when dry, as if mixed with clay. Usually the soil is moist all the way to water, at a depth of 8 to 16 feet. I prefer to sow in April, although May will do, and to use land that has been in cultivation for several years. This should be plowed in the fall, and thoroughly pulverized before seeding. I always sow broadcast and harrow once afterward. As often as the weeds are a foot high they are cut, and left on the ground; there may be four cuttings of this kind, and sometimes the last will do for hay. The plant is not liable to winterkill here, and we do not irrigate. The third year from seeding gives a full yield, and I have never seen any deteriorate. It has seemed best to cut the first crop for seed when about three-fourths of the seed pods are black or brown. I cut with a mower in the morning, rake afternoon, and stack the next day; in other words, I get it into the stack as soon as possible. After the seed is harvested there will be one crop of hay, which should be cut when well in bloom, raked as soon as wilted, left to cure in the windrow, and stacked when about three-fourths cured. I put up in ricks about 14 feet wide. When no seed is saved there are three or four crops of hay, averaging $1\frac{1}{2}$ tons to the acre each. The cost of my alfalfa in the stack is about \$2.75 a ton. The cost of thrashing and cleaning

seed is about 75 cents a bushel, and, while the ordinary machine wastes some seed, I have never tried anything else. An average yield is about six bushels per acre. The thrashed straw is worth about three-fourths as much as that not allowed to ripen. Horses and cattle grow fat on alfalfa hay, without grain. The pasturage is good and profitable for horses, and one acre of it is worth two of clover for cattle and swine. As nearly as I can judge, 10 or 15 hogs on one acre, for six months, would gain 10 pounds a month, or more.

WABAUNSEE COUNTY.

Robert Enlon, Wamego.—I have raised alfalfa for 12 years, and have 150 acres. The land is creek "bottom," and upland — ashy, mellow loam, with subsoil of lightish clay. Water is found 25 to 30 feet from the surface. In preparing for alfalfa, plow in the fall; sow as soon as the ground is in good condition in the spring, 20 pounds per acre, drilled in shallow. Keep the weeds mowed down the first year; if the land is good and the season favorable, a light crop of hay can be obtained the first year, of from one-half to one ton per acre. Alfalfa is not liable to winterkill. We do not irrigate. After the first year, from two to three cuttings are obtained, according to the season. The second year, it yields from one-half to one ton per acre each cutting; after the second, from one to two tons each cutting. Cut for hay when in full bloom; for seed, when it is ripe. The second cutting is preferable for seed, and should be cut and put in small bunches until thoroughly dry; then thrash as soon as possible. After cutting for hay, rake as soon as wilted, and allow it to dry before stacking. Stacks about 30 feet long and 12 wide, well topped out with sorghum, millet, or slough grass, are best. Alfalfa costs, in stack, about \$1 per ton; land is worth from \$15 to \$40 per acre. Baling costs \$1.50 per ton, bales weighing from 65 to 80 pounds. The seed yields from two to four bushels per acre; total expense of thrashing and cleaning, \$1 per bushel. An ordinary thrashing machine will do, but a clover huller is preferable.

I prefer alfalfa hay to either clover or timothy. As pasturage for swine, alfalfa is far superior to clover. On good land, 25 to 30 hogs can be pastured per acre; they will keep thrifty and in good order. It has been found satisfactory for horse and sheep pasture, and just as good as red clover for cattle. Cattle will bloat on rank alfalfa; turn them on full and allow them to remain; they will become accustomed to it. The straw is worth 25 per cent. as much as early cut hay, if not rained on before thrashing. The character of the soil must affect the longevity of the plant. I have some on dry land, sown 12 years ago, and still it is vigorous. It attains its best yields in from two to three years, according to the season. If any crop will do well on high prairie land, alfalfa will. Deep plowing and manure are advisable. I prefer spring sowing, but if sown in August, or the first of September, and a favorable season gives it a good start, it will be a success. I have found that a good top dressing of manure will benefit alfalfa more than it will almost any other crop. The more manure the more hay. I have had considerable experience with other tame grasses, but had no reliable success except with alfalfa. Young stock of all kinds, well sheltered and fed on alfalfa in winter, will do as well as on summer pasture. As rough feed for steers it is excellent; also, for milch cows, keeping them as thrifty as when on summer pasture. Hogs are also benefited by being fed alfalfa during the winter. I have cut six tons of hay per acre in a season.

WALLACE COUNTY.

Frank Neisgerber, Wallace.—My experience covers about eight years, with 32 acres, on "second bottom," some clay and some sand, with a subsoil of stiff clay. Water can be found at a depth of from 12 to 15 feet. In digging my well, the soil was perfectly dry to within four feet of water. The soil on which alfalfa is grown should be

in thorough cultivation. I sowed in the early spring, 16 pounds of seed to the acre. Cut often, as it helps it to stool, and in that manner get ahead of the weeds. The plant is not liable to winterkill. I irrigate once for each cutting, immediately after the hay is taken from the field; irrigation water is obtained from a stream. More water is needed the first two years than later. After the first year I generally cut three times, but last year cut four times. Cut for hay when the bloom starts, and by the time of finishing the last will be in bloom. Cut for seed when the pods are black; the second crop is considered best for seed. In harvesting, rake what is cut in the forenoon in the following afternoon, and cock two days later. Stack, and cover with native hay. Alfalfa is somewhat liable to mold. Alfalfa is good pasturage for swine and horses. Cattle are the only animals I have known to bloat on it, and then only when it was wet with dew or rain. My field has been planted eight years, and proves better every year. One case has come under my observation of alfalfa being sown on upland, and it died out in two or three years.

WICHITA COUNTY.

Samuel Pugh, Leoti.—My experience with alfalfa began in the spring of 1888, and as I had just launched my boat on agricultural waters, I was governed principally by the advice of others. Following their advice, I sowed six pounds per acre. This was on "second bottom" a sandy loam, 25 feet above the water sheet. I sowed in April, and in October of the same year the tops were two feet high and the roots four feet deep. It proved to be seeded too light, and was weaker each year until 1891, when I plowed it up. Since that time, I have been sowing small patches almost every year, on low "bottom," sandy loam, four feet above the water sheet. The proportion of sand increases from the surface of the ground to the water, where it is almost pure sand. The soil is seldom dry to a depth of more than six inches; moisture then increases with the depth. I sow as early in spring as it is possible to get the ground in good condition. If the ground has been plowed the year before, it is better to work it shallow with a disc harrow than to plow it, but if it has been surface worked for some time without plowing, a hard stratum is formed below. In such case, it is better to plow deep; then, with drag and smoothing harrow, work the surface down firm and fine. If the ground has been kept entirely clear of weeds, the seed may be sown and harrowed in without a nurse crop, but if there is weed seed in the ground, it is better to sow barley, using one-half the quantity of seed necessary for a full crop of barley. The ground should be made clean and fine enough that the drill hoes can be set in a straight line, and not drag trash or clods, and leave all the furrows uniformly open. The drill should be run from two to three inches deep, and the barley will be covered about one-half that depth; then, with a hand sower, put on 20 pounds of alfalfa seed per acre, using none but the best. The seed can be covered by going over it with a light drag, or harrow with teeth turned back. The seed I sowed this spring in this manner was up as soon as the barley. I have never, until this year, done anything with the first season's crop; but this year the weeds have made a wonderful growth, and I have been cutting at short intervals, to keep the weeds from seeding. I have never noticed any winterkilling. It often remains green until the middle of December; the young stalks lie flat on the ground when cold weather sets in, and the stubble protects them from frost; but when hard freezing sets in, it disappears until the ground warms up in the spring. I have never attempted to irrigate it but once. I have a belt pump, and two horse power, arranged to water my garden and potatoes by flooding. I raise the water seven feet, and empty into a ditch. This small supply necessitates drawing up small ridges, 30 feet apart each way, which is a great damage to the young plants, as neither those that are cut off or covered up will grow again, besides making

it very uneven to mow over. I have never cut more than three times, until 1893, when I cut four times, beginning June 20, July 20, August 20, and October 10. I cut in full bloom each time, except the last, when it did not bloom on account of cold weather, and I cut it to escape frost. Frost will cut the leaves off, and make it almost worthless for hay. The seed I saved was thrashed in a common thrasher, using a millet riddle; this secured it all and cleaned it well. I generally let the hay lie on the ground about four hours; then put in cocks, and let stand 24 hours; then put in stacks eight feet wide and long enough to hold three or four tons. If it goes in the stack pretty green, it may heat some, but it will not mold if let alone; if opened up, it will mold. The hay in the stack costs me \$2.25 per ton. The price charged for baling is \$2.25 per ton. Alfalfa is far better than any other hay or fodder I have ever used. I have grazed horses, calves and milch cows on it, and have never had a sick animal yet. I raised some hogs last year by cutting and throwing alfalfa in the pen; had only 30 bushels of corn to finish them on, and had 1,400 pounds of pork.

Alfalfa will fall behind red clover for green manure, as it is almost impossible to plow it under and keep it there. If the crowns are turned under, where there is any moisture at all, they will grow again; and, if turned under deep, it is almost impossible to get them killed out. I plowed a piece of heavy sod for potatoes. It took two years to get rid of the plants, and not a crown ever died that I did not pull out where the sun could dry it. I have seen several pieces started on the high prairies, but never saw anyone make a success of it yet; but, in all that I have had an opportunity to learn the particulars, the man was more to blame than the plant or the land, some of the land never having been plowed more than two inches deep. Alfalfa is destined to be the most reliable plant that has ever come into the state, for different reasons: The hot winds have never been able to make it drop a leaf during these two years of almost continuous dry weather; it will kill out any weeds in existence, and keep out any that try to get a foothold. The man who has his land all set to alfalfa will not lose much sleep on account of the Russian thistle. There are so many channels through which he can turn his crop into money, that he has a great advantage over the wheat grower. There are hay, seed, horses, cattle, hogs, and sheep. If he is handling one kind of stock, and finds it is going down, and another will pay better, he does not have to remodel his farm to change. It can be harvested and stacked in a windstorm that would carry prairie hay to an adjoining state. A leading agriculturist says: "Find what suits your locality, and stick to it." I have been eight years finding this out, and am going to put every foot of my place in alfalfa as fast as I am able. Alfalfa is "the way out;" it is a mortgage-lifter and a calamity-killer.

FEEDING WHEAT TO FARM-ANIMALS.

ITS PRACTICE IN KANSAS, AND SOMETHING OF ITS BEARING UPON
AGRICULTURE AND STOCK-RAISING.

INTRODUCTORY NOTES BY THE SECRETARY.

In the news and agricultural papers, for a year past or longer, there have appeared occasional references to the fact that here or there some one was making himself an object of more or less good-natured wonder by using surplus wheat in lieu of corn as a stock food. It gradually became evident that, owing to the shortage and comparatively high price of corn, the considerable accumulations of wheat, its unprecedented low price, and generally unquestioned worth as a nutritive ration, a much greater aggregate of it was being withheld from the milling market and diverted to the new and widely differing purposes of meat production than there were any statistics available to verify. Appreciating the importance and interest attached to this new phase of the agricultural problem, its present connection with and probable future bearing upon both grain and animal production, but without disposition to unduly magnify the subject, or in any way appear to "boom" it as a new departure, the Kansas Department of Agriculture during the summer of 1894 undertook to obtain such definite, helpful information as it might from the people in every county of the state, showing to what extent the previous year's crop was being used as animal food, the preferred methods of preparation and using, its approximate cost of production in Kansas with varying yields, the ordinary returns from its use as a feed, its merits as a growth, meat and milk-maker, compared with corn—the chief staple and generally accepted standard in the central West—and such further practical observations as their experience might suggest. As a preliminary to this, there were procured the names and addresses of 1,000 wheat-growers, stock-growers, feeders, dairymen and others best situated and equipped for discriminate observing along the lines of this investigation. To these names there were sent, with a request for careful answers, the list of questions below:

QUESTIONS.

What proportion of last or the previous year's wheat crop in your county do you estimate as having been fed to farm animals? *Ans.*.....per cent.

Is it usually fed whole, dry or soaked, or ground? *Ans.*.....

Fed whole, about what percentage, if any, passes the animals without being masticated? *Ans.*.....per cent.

Does it appear as nourishing and healthful as corn? *Ans.*.....

Fed to hogs, does it prove as fattening, pound for pound, as shelled corn? *Ans.*.....per cent. greater.per cent. less.

How much live pork may be expected as a fair return per bushel of wheat fed to hogs? *Ans.*.....pounds.

At the same price per bushel (56 pounds of shelled corn and 60 pounds of wheat), what greater or less value would wheat have than corn as a grain for hogs? *Ans.*.....per cent. greater.per cent. less.

Leaving cost out of the question, is it found a satisfactory grain for growing or fattening hogs, and if not, wherein is it defective? *Ans.*.....

Is the flesh of wheat-fed hogs as good or better than that from hogs fed on other staple foods, and in what respect does it differ? *Ans.*.....

If for any reason wheat is not found a satisfactory grain ration for hogs, what admixture of other grains will make it so, and in what proportion? *Ans.*.....

Is it being fed to work animals, and if so, is it used alone or mixed with other grains, and in what proportions? *Ans.*.....

Does it maintain the strength of working animals as well or better than corn or oats? *Ans.*.....

Do horses thrive or fatten upon it as well or better than upon corn or oats? *Ans.*.....

Used alone, as the full-grain ration, what quantity is given at a feed as compared with the quantity of shelled corn that would be used if corn was plentiful? *Ans.*.....

Is it fed to milch cows or other cattle, and with what effect as to milk and flesh, compared with corn? *Ans.*.....

At the same price per bushel, what greater or less value would wheat have than corn, as a grain for horses? *Ans.*.....per cent. greater.per cent. less. For milch cows? *Ans.*.....per cent. greater.per cent. less. For other cattle? *Ans.*.....per cent. greater.per cent. less.

About what is the present market worth per bushel of wheat on the farm where raised, in your county? *Ans.*.....cents per bushel. Of corn? *Ans.*.....cents per bushel.

At the present price of wheat as stated, and of pork, mutton, beef, and dairy products, can it be more profitably used as feed than sold to millers or shippers? *Ans.*.....

Would it be profitable, in your judgment, in case of needing the wheat or its equivalent for feed, to sell wheat at 40 cents and buy corn at 30 cents per bushel (or like relative prices) and do the hauling both ways? *Ans.*.....

From a feeder's standpoint, would it not be profitable to exchange good wheat at near-by mills for shorts and bran at current prices of each? *Ans.*.....

What is the customary toll or charge for grinding wheat, suitably for feed, at the public mills? *Ans.*.....toll.cents per bushel.

Is its value increased enough by grinding to overbalance such toll or expense? *Ans.*.....

If grinding on the farm is practiced, what is the method, the style of mill, and the cost per bushel? *Ans.*.....

What does your wheat cost per bushel in the bin (including 7 per cent. interest on value of the land upon which raised, also wear and tear of equipment), if the yield is 10 bushels per acre? *Ans.*..... cents: 15 bushels per acre,cents; 20 bushels per acre,cents; 25 bushels per acre,cents; 30 bushels per acre,cents; 35 bushels per acre,cents.

What is ordinarily the value per acre of your wheat straw, to use or to sell? *Ans.*.....

What is the present value of the land per acre upon which wheat is produced at the cost named? *Ans.*.....

Kindly state here any further observations you may have noted bearing upon the use of wheat as food for animals in Kansas:

WHAT THE REPLIES INDICATED.

The replies of about 400 of those who received the question blanks were of such a character as to make them very useful contributions, and, having been edited and condensed, a representative proportion of them is, with much other collateral matter, presented herewith in detail. From the answers and estimates of these observant and practical men who have viewed the subjects from the many divergent standpoints incident to a state with so large an area as Kansas, and a separation, in some instances, of possibly 500 miles, numerous very interesting averages and deductions are reached. Some of these are as follows:

Of the 24,827,523 bushels of winter and spring wheat raised in Kansas in 1893, there was used as feed for farm animals 4,059,323 bushels, or 16.4 per cent., Cowley and Sumner counties leading, with 297,044 and 407,606 bushels, respectively.

When fed whole, (perhaps more especially to hogs,) 25 per cent. of it passes the animals unmasticated and, hence, undigested and unassimilated—a shameful waste. The average of the estimates made by 81 correspondents in 20 counties is that more than 30 per cent. is voided without mastication; 12 correspondents, representing five counties, put it at 50 per cent. or above, and a few others name a higher figure, while 40, reporting from 12 counties, average at 10 per cent.

Three-fourths of those reporting, representing 50 counties, state that, pound for pound, wheat is superior to corn for fattening hogs (even with the one-fourth unmasticated) by 7 to 35 per cent.; the average of these indicating a superiority over

corn of 16 per cent., while the average of the other one-fourth of the reports, representing 26 counties, indicates that it was considered of less worth than corn by 12 per cent.

To the question as to how much live pork may be expected as a fair return per bushel of wheat fed to hogs, the average of all the answers is 11 pounds, and the variations from 7 pounds, in a single instance, to as much as 20 pounds in one other; but nearly all put their figures at or above 10 pounds.

The averages of all the reports as to the cost of wheat, raised and in the bin, "including 7 per cent. interest on the value of land upon which raised; also labor and wear and tear of equipment," with different yields, show thus:

Yield of 10 bushels per acre, 56½ cents per bushel.

Yield of 15 bushels per acre, 48 cents per bushel.

Yield of 20 bushels per acre, 35¼ cents per bushel.

Yield of 25 bushels per acre, 31 cents per bushel.

Yield of 30 bushels per acre, 27 cents per bushel.

Yield of 35 bushels per acre, 26 cents per bushel.

The highest and lowest average cost per bushel, given by counties, under the six different yields named, and the average value per acre, by counties, of the land upon which grown, are shown as follows:

HIGHEST AVERAGE.				LOWEST AVERAGE.		
COUNTY.	Yield per acre, bushels.	Highest cost per bushel, in cents.	Value of land per acre.	COUNTY.	Lowest cost per bushel, in cents.	Value of land per acre.
Wyandotte.....	10	88	\$50 00	Stanton	27	\$2 00
Wilson	15	66	20 00	Stanton	21	2 00
Wyandotte.....	20	52	50 00	Stanton	17	2 00
Miami	25	50	40 00	Stanton	16	2 00
Wyandotte.....	30	40	50 00	Stanton	15	2 00
Wyandotte.....	35	38	50 00	Grant	13	5 00

An average of wheat land values, as stated from all the counties, is \$19.35 per acre, and these valuations range from \$50 in Wyandotte, \$45 in Atchison and Brown, \$40 in Allen, Jefferson, Johnson, and Miami, and \$37 in Cowley, to \$6 in Cheyenne, Morton, Sheridan, and Sherman, \$5 in Finney, Grant, Meade, and Wallace, \$4 in Lane and Seward, \$3 in Haskell and Scott, and \$2 in Stanton.

In reply to the question, "What is ordinarily the value per acre of your wheat straw, to use or to sell?" the composite reply is 81 cents, the extreme range being from 25 cents in Thomas and Jewell to \$2 in Kiowa, \$1.75 in Morton, and \$1.50 in Decatur, Doniphan, Leavenworth and Shawnee counties.

Responses from 85 counties, having all the wheat raised except 181,514 bushels, received within the last days of September, 1894, to inquiries sent to 500 correspondents, asking their estimates on the percentage of the wheat crop of the year likely to be fed to farm animals, represented it as 30.4 per cent. of the wheat in those counties; a total of 8,524,983 bushels, or 110 per cent. (4,465,660 bushels), more than the entire crop of 1893 so used.

A SUMMARY OF CONCLUSIONS.

In a general way these reports show:

In Kansas, under the conditions as to product and prices of wheat and corn existing in the years 1893-'94-'95, wheat became a very unusual and very important factor in the grain-feeding of all classes of farm stock.

It is superior to corn, pound for pound, as a grain to produce healthful, well-balanced growth in young animals.

Mixed with corn, oats, or bran, it is much superior to either alone,^a for work-horses.

Fed to cows, it is an exceptional milk-producer, and for that purpose corn is scarcely to be compared with it.

For swine of all ages, it is a healthful and agreeable food, giving generous returns in both framework and flesh, but fed whole, especially without soaking, is used at a disadvantage. Ground and made into slops, it is invaluable for suckling sows, and for pigs both before and after weaning. Yet, while the testimony is so favorable to wheat as a food for swine during their growing period, the consensus of opinion among shippers, dealers and packers at this time, so far as ascertained, is that, in finishing for the market, corn, or a considerable percentage of corn, yields flesh of a texture and quality superior to that made from wheat alone.

For cattle, it has, at least as a part of their grain ration, a very high value which is much enhanced in the line of needed variety by mixing with corn, and in a still greater degree by mixing judiciously with bran, oil meal or other albuminous foods tending to balance the too carbonaceous nature of the clear wheat.

With corn and wheat approximating the same price per bushel, it is not unprofitable or wicked to feed the wheat; yet, if it can be ground, rolled, crushed or in some way broken at a total cost not exceeding 5 to 7 cents per bushel, to feed it whole and dry is unwise.

It can be ground at a cost of 5 cents per bushel, and on a majority of Kansas farms for very much less.

If grinding is impracticable, soaking from 24 to 36 hours (the length of time depending somewhat upon the weather and season) is for various reasons deemed desirable, but is injudicious to any extent that its being moist facilitates swallowing without mastication or the proper mixing with saliva. Any arrangement or system of feeding by which the grain could be delivered in such a way that the animal could eat but slowly, would largely overcome this defect. No means has been suggested better than scattering on the bottom of a clean trough, a floor, or on the ground.

It is a superior feed for all fowls, and, as a promoter of the maximum egg-production, is unsurpassed by any other grain.

RESULTS FROM WHEAT-FEEDING AT THE EXPERIMENT STATIONS.

TWO OREGON EXPERIMENTS.

In September, 1891, Prof. H. T. French, agriculturist to the Oregon state experiment station, at Corvallis, undertook a pig-feeding experiment in which wheat figured prominently as one of the food stuffs. Previous to the beginning of the experiment, questions bearing on the subject of pig feeding were submitted to 75 leading farmers. From the replies to these questions, it appears that wheat has been employed in Oregon as a fattening food for swine for many years, and that it is now more commonly fed than any other grain.

The experiment was conducted with six fine and uniform Berkshire pigs, purchased, and weaned by an accident to the sow at four weeks of age, and kept in a thrifty, growing condition by liberal rations of kitchen slops and shorts, but no green food. For the purposes of the experiment, the pigs were divided into three lots of two each, consisting of a sow and barrow.

The first lot was fed chopped oats for two months; then ground wheat for two months. The pigs were weighed every two weeks to determine the gain made. The two pigs weighed, at the beginning of the experiment, 302 pounds. During the first two weeks, on chopped oats, they gained 11 pounds; during the second two weeks, 36 pounds; during the third two weeks, 27 pounds; and during the fourth two weeks, 34 pounds.

At this point the feed was changed to ground wheat, and a marked acceleration in the rate of gain resulted. During the first two weeks on the ground wheat ration, the two pigs gained $67\frac{1}{2}$ pounds; during the second two weeks, 69 pounds; during the third two weeks, $66\frac{1}{2}$ pounds; and during the fourth two weeks, $19\frac{1}{2}$ pounds.

The total gain for 60 days on chopped oats was 108 pounds, or nine-tenths of a pound a day for each pig. The total gain for 60 days on ground wheat was $222\frac{1}{2}$ pounds, or almost two pounds a day for each pig. Of oats, the pigs consumed $585\frac{1}{2}$ pounds, and of wheat, 1,017 pounds. Of oats, it took 5.4 pounds to make a pound of gain, and of wheat, it took a trifle less than 4.6 pounds.

A second lot of two pigs was fed on whole oats for 60 days, and then on whole wheat for 60 days. In the case of this lot, the difference in favor of wheat over oats was much less marked; indeed, from the standpoint of the relation of food to gain, it had disappeared altogether. The pigs weighed, at the beginning, 316 pounds. During the 60 days that they were fed on whole oats, they gained 129 pounds, or a trifle more than a pound a day for each pig. During the 60 days after the feed was changed to whole wheat, they gained 179 pounds, or $1\frac{1}{2}$ pounds a day for each pig. Of oats, they consumed 732 pounds, and of wheat, $1,087\frac{1}{2}$ pounds making the quantity of oats necessary to a pound of gain nearly 5.7 pounds, and of wheat, nearly 6.1 pounds.

The results obtained with the third lot of two pigs, which were fed on a mixture of chopped oats, wheat, barley, and shorts, are interesting in this connection only as showing much greater gains from the mixture than from either chopped or whole oats, and much smaller gains than from either whole or ground wheat.

A cross comparison between the results obtained from whole wheat and from ground wheat is interesting. The first lot of pigs weighed 410 pounds when the feed was changed from chopped oats to ground wheat. During the next 60 days they gained $222\frac{1}{2}$ pounds. The second lot weighed 445 pounds when the ration was changed from whole oats to whole wheat, and during the next 60 days made a gain of 179 pounds. The $222\frac{1}{2}$ pounds of gain on ground wheat was made at a cost of 1,017 pounds of food, or at the rate of 4.6 pounds of food to a pound of gain. The 179 pounds of gain on whole wheat was made at a cost of $1,087\frac{1}{2}$ pounds, or at the rate of 6.1 pounds of food to a pound of gain. The meat of the pigs which were fed whole grain showed a somewhat greater percentage of fat than that of the mixed-ration carcass shown, but not so great a percentage as the meat of the chopped-grain carcasses.

It is difficult to make any definite statement of fact in regard to the quality of the meat produced by the different foods used, except that the mixed ration seemed to produce the best "marbling," with somewhat the greatest proportion of lean.

Another experiment in feeding wheat to hogs was conducted by Professor French at the same station in 1892. In this experiment, pigs weighing 300 pounds each made considerably better gains on ground wheat than on a mixture of chopped oats, wheat, and shorts, two pigs in four weeks gaining 147 pounds on the wheat ration, and two others of similar weight and equal thrift gaining but $124\frac{1}{2}$ pounds during the same period on the mixture. During these four weeks it took 4.44 pounds of wheat to make a pound of gain, while it took 5.25 pounds of the mixture.

As the pigs grew heavier the showing in favor of clear wheat was more marked.

During the second four weeks' period the two pigs fed on wheat made a gain of 139 pounds, and the two on the mixture but 94½ pounds. The wheat-fed lot required 4.94 pounds of food for each pound of gain, and those fed on the mixture required 6.35 pounds. The results of the third four weeks' period were 114 pounds of gain for the wheat-fed lot and 59½ pounds for the mixed-ration lot, the former requiring 5.97 pounds of food for each pound of gain, and the latter 9.03 pounds..

At the beginning of the trial as between wheat and the mixture, the two pigs to be fed wheat weighed, together, 544 pounds, and the lot to be fed the mixed ration weighed 592½ pounds. At the conclusion of the experiment, 12 weeks later, the wheat-fed lot weighed 941½ pounds, and the mixture-fed lot weighed 871 pounds. The wheat-fed lot gained 397½ pounds, at a cost of 2,022 pounds of wheat. As the wheat was valued at 45 cents a bushel, the cost of each pound of gain was a very small fraction less than 4 cents.

It is worthy of note that, in butchering, the shrinkage of the mixed-ration lot was 15 per cent. of the live weight, and of the wheat-fed lot only 13 per cent.

A SOUTH DAKOTA EXPERIMENT.

In September, 1893, Prof. E. C. Chilcott undertook by means of experiments, at the South Dakota experiment station, at Brookings, to discover something as to the profitableness of wheat as a food for swine. Bulletin No. 38 of the station embodies an elaborate statement of the results obtained.

For the purpose of experiment, eight pigs, averaging about 90 pounds in weight, were divided into four lots of two each.

Lot 1 was fed entirely upon Canada field peas, unground.

Lot 2 was fed upon spring wheat of rather poor quality, unground.

Lot 3 was fed upon Dakota-grown dent corn, ground.

Lot 4 was fed upon spring wheat, same quality as that fed to lot 2, ground.

The pigs were given all the food they could be induced to eat. Each lot was weighed once a week.

The feeding term covered 90 days, and was divided into three unequal periods — the first of 25, the second of 28 and the third of 37 days.

The following tables present concisely some of the results of the experiment. It is to be kept in mind that the figures in each case apply to a "lot" of two pigs.

Lot 1—Peas.

PIGS WEIGHED AT BEGINNING, 164 POUNDS.	First period.	Second period.	Third period.	Entire term.
Gain made, pounds.....	60	86	72	218
Gain per day, pounds.....	2.40	3.07	1.95	2.42
Feed consumed, pounds.....	202	283	433	918
Pounds feed per pound gain.....	3.37	3.29	6.01	4.21
Gain per bushel of feed, pounds.....	17.90	18.23	9.98	14.25

Lot 2—Unground Wheat.

PIGS WEIGHED AT BEGINNING, 174 POUNDS.	First period.	Second period.	Third period.	Entire term.
Gain made, pounds.....	52	78	73	203
Gain per day, pounds.....	2.08	2.78	1.97	2.25
Feed consumed, pounds.....	255	349	393	995
Pounds feed per pound gain.....	4.90	4.47	5.39	4.91
Gain per bushel of feed, pounds.....	12.24	13.42	11.13	12.22

Lot 3—Corn Meal.

PIGS WEIGHED AT BEGINNING, 191 POUNDS.	First period.	Second period.	Third period.	Entire term.
Gain made, pounds.....	65	88	100	253
Gain per day, pounds.....	2.69	3.14	2.70	2.81
Feed consumed, pounds.....	291	385	483	1,159
Pounds feed per pound gained.....	4.47	4.37	4.83	4.58
Gain per bushel of feed, pounds.....	12.53	12.81	11.59	12.22

Lot 4—Ground Wheat.

PIGS WEIGHED AT BEGINNING, 205 POUNDS.	First period.	Second period.	Third period.	Entire term.
Gain made, pounds.....	58	87	93	238
Gain per day, pounds.....	2.32	3.10	2.51	2.64
Feed consumed, pounds.....	288	366	490	1,144
Pounds feed per pound gain.....	4.96	4.20	5.26	4.81
Gain per bushel of feed, pounds.....	12.09	14.28	11.40	12.49

Summary for Entire Term.

LOTS AND KINDS OF FEED.	Total gain, pounds.	Gain per day, pounds.	Feed consumed, pounds.	Pounds feed per pound gain.	Gain per bushel of feed.
Lot 1, peas.....	218	2.42	918	4.21	14.25
Lot 2, unground wheat.....	203	2.25	995	4.91	12.22
Lot 3, corn.....	253	2.81	1,159	4.58	12.22
Lot 4, ground wheat.....	238	2.64	1,144	4.81	12.49

During the first period, 1 pound of corn meal was equal to 1.10 pounds of unground wheat, or 1.11 pounds of ground wheat.

During the second period, 1 pound of corn meal was equal to 1.02 pounds of unground wheat, or .97 pound of ground wheat.

During the third period, 1 pound of corn meal was equal to 1.11 pounds of unground wheat, or 1.09 pounds of ground wheat.

The financial statement, as given in the bulletin under review, is interesting. It is as here:

STATEMENT.	Lot 1. Peas.	Lot 2. Unground wheat.	Lot 3. Ground corn.	Lot 4. Ground wheat.
Total dressed weight, Dec. 6.....	316	313	382	370
Received for dressed pork, at 5½c. per pound.....	\$17 38	\$17 11	\$21 01	\$20 35
Cost of hogs, Sept. 5, at 4½c. per pound, live weight..	7 38	7 83	8 59	9 22
Balance to pay for feed.....	10 00	9 28	12 42	11 13
Feed consumed, bushels.....	15.30	16.62	20.71	19.06
Price per bushel realized.....	\$0 65.36	\$0 55.83	\$0 60.00	\$0 58.39

The questions which it was sought to answer through the experiment were as follows:

1. Can the farmers of this state realize more from their wheat by feeding it to hogs than by selling it, at present prices of wheat and hogs?

2. Can wheat be profitably fed without some other food to form a balanced ration?

3. Will it pay to grind wheat as food for hogs?

4. How does wheat compare with corn and peas (Canada field peas) as food for hogs?

5. How does the quality of pork made from wheat compare with that made from corn, peas, and mixed food?

6. How does the average gain of hogs fed on an exclusive diet of wheat, corn or peas compare with that of hogs fed on mixed food?

7. When should fattening begin, and how long should it continue?

Professor Chilcott thus summarizes the answers which he believes he obtained:

"1. Hogs averaging about 100 pounds in weight can be purchased near September 1 at \$4.50 per cwt., live weight, fed three months on nothing but wheat, water, ashes, and salt, and an occasional handful of hay or corn fodder, butchered and sold December 1 for \$5.50 per cwt., dressed, and will return from 56 to 58 cents per bushel for wheat consumed, without allowing anything for manure or labor in caring for hogs.

"2. At present prices, wheat can be profitably fed as an entire ration, but it would undoubtedly *pay better* to mix it with some other food, particularly during the early stages of fattening.

"3. Hogs fed on ground wheat made a more rapid and uniform gain, and produced pork of rather better quality; but they also consumed more food than those fed upon whole wheat. Those fed ground wheat required 4.81 pounds of wheat to produce one pound of gain, while those fed whole wheat required 4.91 pounds to make the same gain. Ground wheat brought 58.39 cents per bushel, while that fed whole brought 55.83 cents per bushel, a difference of only 2.56 cents per bushel. This would hardly pay for grinding, but considering the better quality of the pork and greater weight, it would probably pay to grind, if it could be done without much extra cost.

"4. Ground wheat brought 58.39 cents, whole wheat 55.83 cents, peas 65.36 cents, and corn 60 cents per bushel, on an average, for all the grain consumed during the entire experiment, continuing for 90 days. Hogs fed on peas did much better, in proportion, during the first part of the experiment than they did during the latter part, which would indicate that peas are not as good for a complete ration for a long period as either wheat or corn.

"5. The quality of the pork made from corn and ground wheat was about equal, and was superior to that made from whole wheat, peas, or mixed food. That made from mixed food was the fattest [see cuts].

"6. The average daily gain of hogs fed on peas was 1.21 pounds; on whole wheat, 1.12 pounds; on ground corn, 1.40 pounds; on ground wheat, 1.32 pounds; and on mixed foods, 1.61 pounds.

"7. This question was not settled; but it was very plainly demonstrated that a considerably larger return per bushel for food consumed would have been realized if the hogs had been sold at the end of the second period. This was particularly true of lot 1, fed on peas. The decrease in rate of gain in proportion to food consumption for those fed corn meal and wheat was no greater than could be accounted for by the natural result of increased weight and age.

"Better results would undoubtedly have been obtained if the change from mixed food and plenty of exercise to close confinement and a single article of food, to which they were not accustomed, had been made gradually; as the number of pounds of food required to a pound of gain was greater during the first period than during the second, whereas, it should have been less."

Plates I, II, III and IV represents cross sections of the carcasses of the pigs in this experiment. The sections were made just back of the kidneys. Only the hind

half of each carcass is shown. There was considerable difference in the proportion of lean and fat meat in the different lots. Lot 3 (plate III), fed on corn meal, showed much less lean meat in proportion to the fat than did the other lots. In lots 1, 2, and 4 (plates I, II, and IV), the proportion of lean to fat meat did not vary more among the several lots than it did between different individuals of the same lot.

AN OHIO EXPERIMENT.

That 50 cent wheat may be profitably fed to 5 cent hogs has been abundantly demonstrated. It has also been demonstrated that 50 cent corn may be profitably fed to 5 cent hogs. The real question is, which is the more profitable at ruling prices? Shall a farmer sell corn to buy wheat, or sell wheat to buy corn, to feed to hogs? Or, having both, which shall he feed and which shall he sell or hold for future sale? An experiment was recently made at Ohio state university for the purpose of beginning the solving of these questions, and the corn fed whole and dry was almost completely masticated. No kernels passed through the hog whole, and only occasionally were pieces of corn recognizable in the dung. In the case of the wheat, however, fed in the same manner, much of it was not properly masticated, as many whole grains were to be found. Nine high-grade Poland-China hogs—six barrows and three sows—whose average weight was 135 pounds, were fed, during a preliminary week, on corn and wheat, half and half by weight. They were divided into three lots, with two barrows and one sow in each lot, due regard being given to weight and apparent feeding quality. One lot was then fed corn, another wheat, and the other wheat and corn, half and half by weight. In addition, each lot was given water, coal ashes, sulphur, and salt, but no other food whatever.

The hogs were weighed two days before the beginning, two days after the beginning, and upon the day the experiment began. The average of these three weighings is taken as the initial weight. The final weights were obtained in the same way. The experiment continued during 10 weeks. A summary of the results is given in the following table:

TABLE SHOWING FOOD VALUE OF WHEAT AND CORN.		LOT A. <i>Wheat.</i>	LOT B. <i>Wheat and corn.</i>	LOT C. <i>Corn.</i>
Average weight February 8, 10, and 12.....	lbs.	411.00	401.00	407.00
Average weight April 19, 21, and 23.....	"	702.00	693.00	678.00
Gain during 10 weeks.....	"	291.00	292.00	271.00
Gain daily per pig.....	"	1.39	1.39	1.29
Total food eaten during 10 weeks.....	"	1,273.00	1,240.00	1,228.00
Food eaten daily per pig.....	"	6.02	5.90	5.85
Amount of food to make 100 pounds increase.....	"	438.00	425.00	453.00
Increase from one bushel.....	"	13.70	.....	12.30
Value of bushel, at \$5.15 cwt.....	cts.	70.50	.....	63.30
Cost of food for 100 pounds of increase (corn 35c., wheat 55c.).....		\$4.01	.....	\$2.85

The best results for the number of pounds eaten were obtained where corn and wheat were fed half and half by weight. The next best result was obtained from feeding wheat alone, while, where corn was fed alone, the least increase was made for the number of pounds eaten. The differences in all cases were slight, in no instance being greater than might be reasonably expected with three lots of carefully selected hogs fed on exactly the same kind of food.

It took 438 pounds of wheat to make 100 pounds of increase, and 453 pounds of corn to produce the same gain in weight. A bushel of wheat made 13.7 pounds of pork, while a bushel of corn made 12.3 pounds. This is in part due to the different feeding values of the wheat and corn, and part to the fact that there are 60 pounds of wheat in a bushel, and only 56 pounds in a bushel of corn. The hogs sold for

\$5.15 per 100 pounds. Putting aside the question of labor, a bushel of wheat brought 70.5 cents, and a bushel of corn 63.3 cents. With wheat at 55 cents per bushel, the cost of food for 100 pounds of increase was \$4.01, while with corn at 35 cents per bushel, the cost of the food for 100 pounds of increase was \$2.85. According to this experiment, it would have been a profitable procedure to trade wheat for corn at the ruling prices, for the purpose of fattening hogs.

A UTAH EXPERIMENT.

December 4, 1893, the Utah experiment station, at Logan, begun an experiment with 12 pure-bred, thrifty Berkshire boars, from 11 to 19 weeks old, divided into four practically even sets of three each, to test the profit and relative values of wheat, peas, corn, and barley, when mixed with one-half their weight of wheat bran. The grain was ground, each mixed with the bran, and made into slop with clear water at the time of feeding, and given twice a day, all the pigs would eat clean. Access was given also to a mixture of salt and wood ashes. At the beginning the sets weighed as follows:

Set 1, fed wheat and bran.....	106 pounds.
Set 2, fed peas and bran.....	111 "
Set 3, fed corn and bran.....	112 "
Set 4, fed barley and bran.....	112 "

May 16, after 5½ months' or 161 days' feeding, they weighed like this:

Set 1.....	439 pounds.
Set 2.....	639 "
Set 3.....	415 "
Set 4.....	381 "

This shows the set fed on the pea mixture as 200 pounds heavier than those of the wheat mixture, and 224 and 258 pounds, respectively, heavier than those fed on the corn and barley mixtures.

The average gain per week per set and total gain were:

Set 1.....	14.47 pounds.....	Average gain per day per pig,	.69 pounds.
Set 2.....	22.95 ".....	" " " "	1.09 "
Set 3.....	13.17 ".....	" " " "	.63 "
Set 4.....	11.69 ".....	" " " "	.56 "

Total gain per set, December 6 to May 16:

Set 1.....	333 pounds.
Set 2.....	528 "
Set 3.....	303 "
Set 4.....	269 "

The prices estimated as the cost of the foods used — and actually paid, except for corn — were these:

Wheat, ground.....	\$0 75 per cwt.
Peas, ".....	1 25 "
Corn, ".....	75 "
Barley, ".....	80 "
Bran.....	50 "

The following table gives some of the interesting figures covering the entire feeding period of 161 days:

Average gain per pig per day.....	lbs.	.69	1.09	.63	.56
Food eaten: Wheat, peas, corn, and barley.....	"	672.22	959.71	689.34	621.85
Bran.....	"	672.22	959.71	689.34	621.85
Total.....	"	1,344.44	1,919.42	1,378.68	1,243.70
Amount of food for 1 pound of gain, live weight.....	"	4.02	3.63	4.55	4.62
Cost of grain for 1 pound of pork, live weight.....	cts.	2.51	3.18	2.84	3.00

As a rule, in this instance, as in nearly every other, the quantity of food required to produce a pound of gain increased as the period of maturity advanced. Much

more of the pea mixture was eaten than of any other, causing a more rapid gain and requiring less to make the gain.

The following table indicates the cost of the grain for a pound of gain, live weight, at their different stages of growth:

AVERAGE WEIGHT.	SET 1. <i>Fed wheat and bran.</i>	SET 2. <i>Fed peas and bran.</i>	SET 3. <i>Fed corn and bran.</i>	SET 4. <i>Fed barley and bran.</i>
35 to 50 pounds.....cts.	2.35	2.54	2.56	2.72
50 " 100 "....."	2.45	2.65	2.76	2.85
100 " 150 "....."	2.70	2.89	3.21	3.44
150 " 200 "....."		3.49		
35 " 150 "....."	2.49	2.70	2.91	3.00

Some of the foregoing averages are brought together in convenient form in a total, like this:

FROM DECEMBER 6 TO MAY 16.	Average of sets.	SET 1. <i>Fed wheat and bran.</i>	SET 2. <i>Fed peas and bran.</i>	SET 3. <i>Fed corn and bran.</i>	SET 4. <i>Fed barley and bran.</i>
Gain per day, per pig.....lbs.	.74	.69	1.09	.63	.56
Food consumed per day, per pig....."	3.04	2.78	3.97	2.85	2.57
Food consumed for 1 lb. of gain, live wt....."	4.20	4.02	3.63	4.55	4.62
Cost of food for 1 lb. of gain, live wt.....cts.	2.88	2.51	3.18	2.84	3.00

Supt. A. A. Mills, who supervised the work, summarizes his observations from it as follows:

1. Peas mixed with bran, half and half by weight, proved to be far superior to either wheat, corn or barley mixed and fed in the same manner, both as to rapid gain and to the amount required for one pound of gain.

2. The wheat mixture comes second, with corn and barley following, in the order named.

3. The pea mixture gave a gain of nearly 200 pounds more than the wheat mixture, 225 pounds more than the corn mixture, and 259 pounds more than the barley mixture.

4. While the pigs averaged the same weight, it required .89 of a pound more of the wheat mixture, 1.41 pounds more of the corn mixture and 1.53 pounds more of the barley mixture to produce 1 pound of gain, live weight, than of the pea mixture.

5. Peas and wheat proved to be excellent feed, fed mixed with bran in the manner described.

6. Reckoning pork at 4 cents per pound, live weight, after deducting the cost of the bran at \$10 per ton, wheat fed in this experiment brought 89.4 cents per bushel, or \$1.49 per hundred weight; peas, \$1.70 per hundred weight; corn, \$1.26 per hundred weight; and barley, \$1.23 per hundred weight.

7. On the above basis, peas should be worth 13 per cent. more than wheat, while corn should be worth 15 per cent. less, and barley 17 per cent. less.

REPORTS ON WHEAT-FEEDING IN KANSAS,
BY COUNTIES.

ALLEN COUNTY.

J. W. Hamm, Humboldt.—The wheat fed to farm animals has mostly been soaked or ground—very little fed dry. Fed whole, fully 5 per cent. seems to pass the animals without mastication. Wheat seems as nourishing and healthful, or more so, than corn, especially for young hogs. It makes about 14 pounds of live pork per bushel, and, at the same price per bushel, it is about 10 per cent. more valuable for fattening hogs than shelled corn. All farmers in this region who have fed wheat to hogs report very satisfactory results, and that the meat is as good or better than that from corn. Equal parts of wheat and corn ground together is the best food for hogs—better than either fed alone. Work horses are being fed wheat, and they appear to do just as well as on corn; but one part of oats to three parts of wheat is best to maintain their strength and flesh. Ground wheat is a good milk ration. For horses it is 10 per cent. more valuable than corn, and for milch cows about 15 per cent. Wheat is worth 45 cents and corn 37 cents, at which it is more profitable to feed than to ship the wheat. It would not be profitable to exchange wheat at the mills for bran, as the millers are charging more for their bran than for other kinds of feed. It costs about 4 cents per bushel to get the wheat ground at the public mills, and it increases the value of the feed to that amount. Some farmers are using the "Pony" mills, with a capacity of 25 bushels per hour, which makes the grinding cost about 2 cents per bushel. Computing interest on land valued at \$40 per acre, the labor, and wear and tear of equipment, it costs about 77 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 53 cents; 20 bushels, 41 cents; 25 bushels cost 34 cents; 30 bushels, 29 cents, and 35 bushels cost 26 cents per bushel. For feeding pigs or brood sows, there is nothing equal to ground wheat mixed with milky slops. An acre of straw is worth 50 cents.

ATCHISON COUNTY.

Joshua Wheeler, Nortonville (Jefferson County).—The wheat raised in this county and fed to stock has been mostly ground for that purpose. It has been found to be of 10 per cent. less value for horse feed than corn. If wheat was 40 cents and corn 30, to sell the wheat and buy corn would be more profitable, but if this was not convenient, I would exchange the wheat for bran or shorts at the mills. I used a horse-power "American" grinder, at a cost of about 2 cents per bushel. On land worth \$40 to \$50 per acre, it costs, counting everything, \$1 per bushel to grow 10 bushels per acre; 15 bushels cost 70 cents; 20 bushels, 55 cents; 25 bushels, 50 cents; 30 bushels, 44 cents, and 35 bushels, 40 cents per bushel. The straw is valued at \$1 per acre. The greater part of wheat fed to stock has not been of marketable grade. My judgment is, that 56 pounds of shelled corn is worth more for horses and hogs than 60 pounds of wheat. The grinding of oats and wheat together and feeding to horses did not give as good satisfaction as corn and oats.

BARBER COUNTY.

Ed. H. Smith, Hazelton.—Wheat in this county fed to farm animals is mostly whole and soaked, in which form more than 50 per cent. of it passes the animals without mastication. It appears as nourishing as corn, but it is not so strong a

food, and when fed to hogs it does not prove as fattening as shelled corn. The flesh of wheat-fed hogs is good and sweet, but not as solid as that from corn. Wheat is a good growing food for young hogs, but for fattening some corn is necessary—at least equal parts of corn and wheat. It is fed to work horses, but generally mixed, equal parts, with corn or oats, and fed about the same as other grains; but it does not seem to maintain the strength of the horses, and they cannot stand their work as when fed on corn or oats. My experience in feeding milch cows is, that too much wheat dries them up, and that bran is better and safer. With wheat at 40 cents and corn at 30 cents, it would be better to haul both ways and sell the wheat and buy corn. I think it would be a profitable scheme to exchange the wheat at the mills for bran, at current prices, as it is a better and safer feed than wheat. The public mills charge 5 cents per bushel for grinding, but I do not think the feed is increased in value enough to offset the expense. Counting interest on land worth about \$20 per acre and wear and tear of equipment, it costs about 48 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 34 cents; 20 bushels cost 29 cents; 25 bushels cost 25 cents; 30 bushels cost 22 cents; 35 bushels cost 20 cents. This is on the following basis:

Interest, 7 per cent. on \$20.....	\$1 40
Plowing 1 acre.....	1 00
Harrowing.....	10
Seed and drilling.....	1 00
Harvesting and sacking.....	1 00
Thrashing 10 bushels.....	70
Total cost, 10 bushels.....	\$5 20

BARTON COUNTY.

Jno. Armstrong, Great Bend.—It is generally ground, but when fed whole at least 20 per cent. passes the animals without mastication. It appears as healthful and nourishing as corn, especially for young animals and milch cows, and at the same price per bushel it is about 5 per cent. more valuable than corn for feeding hogs. The most satisfactory ration for hogs is equal parts of wheat and corn, ground. It is fed to work horses by mixing—half and half—wheat and corn, chopped, and seems to maintain their strength, and only requires about two-thirds as much in quantity as of corn. There is a large amount of wheat fed to dairy stock, with more satisfaction than corn. At the same price per bushel, wheat is 10 per cent. more valuable than corn for feeding horses, 15 per cent. more for milch cows, and 10 per cent. more for other cattle. Wheat is 36 cents and corn 33 cents; but if there was 10 cents difference in the prices it would not be a profitable transaction to haul both ways to sell the wheat and buy the corn. From the feeder's standpoint, it would not be profitable to exchange wheat at the mills for bran or shorts. The stuff given in return would, much of it, be from the poorest or damaged grain. It costs 6 cents per bushel to have the wheat ground at the public mills, and the increased value of the feed more than overbalances this expense. Steel mills are run by steam power on some farms, and can grind for about 4 cents per bushel. Computing interest at 7 per cent. on the value of the land, and the wear and tear of equipment, it costs about 64 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels, 47 cents; 20 bushels, 38 cents; 25 bushels, 33 cents; 30 bushels, 29 cents; 35 bushels, 26 cents per bushel. Hogs running on alfalfa can be profitably fed ground wheat made into slop, even though the wheat cost 15 cents per bushel more than corn. But for finishing the hogs for market, they should have two weeks of full feeding on corn and water.

BROWN COUNTY.

E. Harrington, Baker.—Wheat is as nourishing and more healthful than corn, being a preventive of disease among the stock. Fed to hogs, it may be 10 per

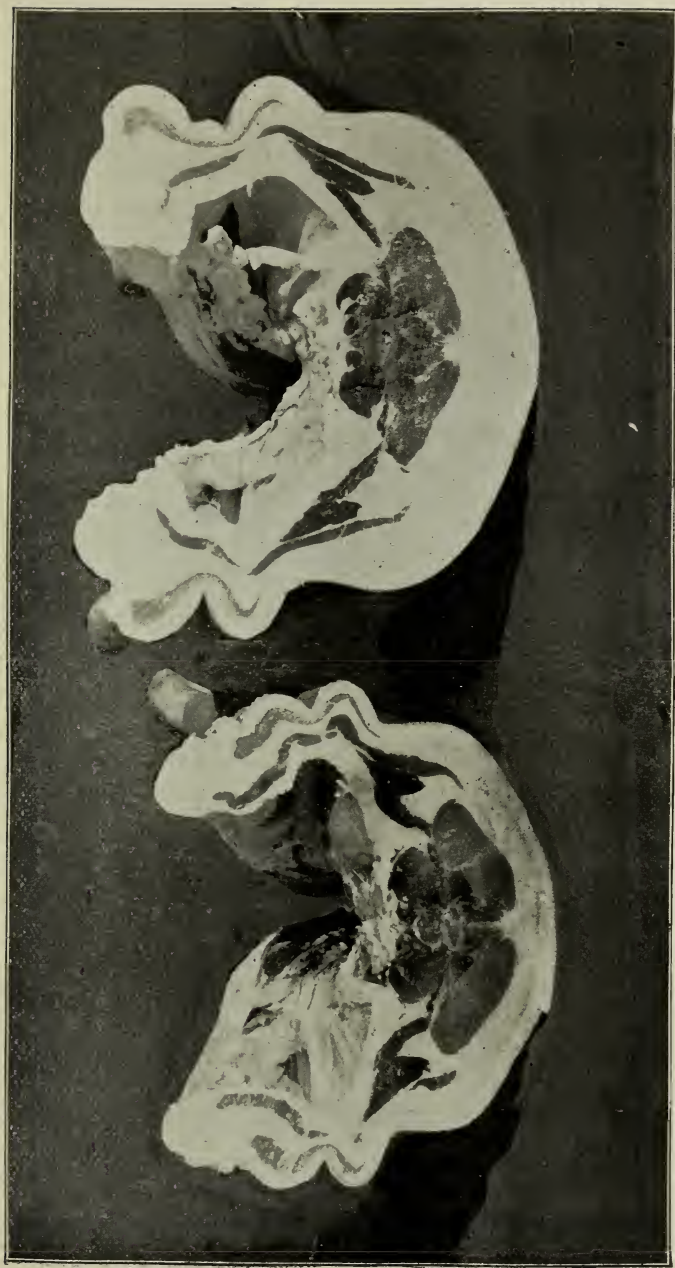


PLATE I.—LOT 1. (See page 463.)

Hogs weighed an aggregate of 382 pounds. Fed on Unground Peas 90 days.



PLATE II.—LOT 2. (See page 463.)

Hogs weighed an aggregate of 377 pounds. Fed on Whole Wheat 90 days.

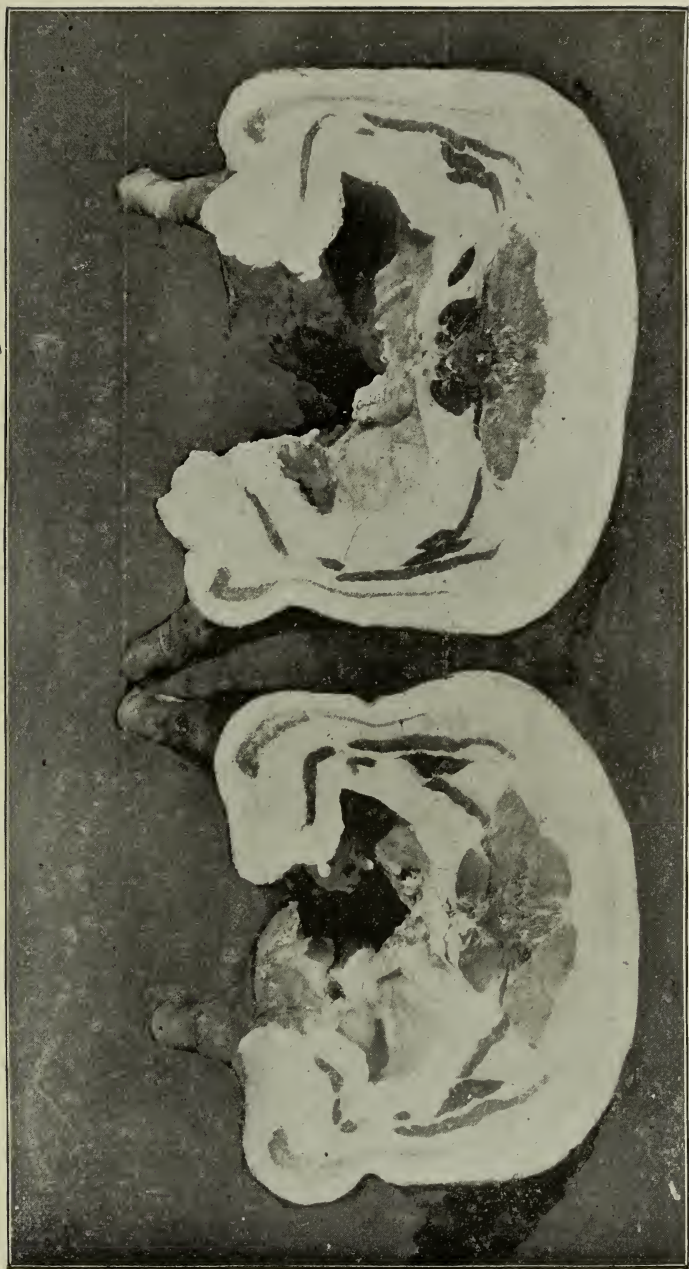


PLATE III.—LOT 3. (See page 463.)
Hogs weighed an aggregate of 444 pounds. Fed on Ground Corn 90 days.



PLATE IV.—LOT 4. (See page 463.)

Hogs weighed an aggregate of 443 pounds. Fed on Ground Wheat 90 days.

cent. less fattening than shelled corn, producing from 8 to 10 pounds of live pork per bushel. It is more satisfactory for growing than fattening hogs; at the same price per bushel the wheat is preferable, as the flesh of the wheat-fed hog is better than that from corn, it being firmer and less oily. The best ration ever fed to hogs is equal parts of wheat, corn, oats and barley ground together. This is fed to work horses, and maintains their strength and flesh well. The experience of wheat feeders is that it should never be used alone. Mixed with other grain, to cows, it increases very perceptibly the flow of milk. For horses wheat is 10 per cent. more valuable than corn; 20 per cent. more for milch cows, and 10 per cent. less for other cattle. Wheat is selling here for 45 cents and corn for 30 cents, at which prices it can be more profitably fed than shipped or sold. Having a mill to do your own grinding, it will not pay to exchange wheat at the mills for bran or shorts at the current prices for those products. The toll at the mills for grinding is 5 cents per bushel, and this additional expense is more than overcome by the increased value of the feed. I use a "Keystone" horse-power mill, and, allowing \$3 per day for man and team, it costs me about 2 cents per bushel to grind my feed. Experience has demonstrated that the above-mentioned mixture fed to farm animals improves their digestion and "livens up" the coat and gives good satisfaction in every way. Computing interest on land worth \$40 per acre, and the wear and tear of implements, it costs about 70 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 50 cents; 20 bushels cost 40 cents; 25 bushels cost 33 cents; 30 bushels cost 30 cents; 35 bushels cost 25 cents per bushel.

BUTLER COUNTY.

C. G. Amlong, Keighley.—When fed whole, some of it passes the animals without mastication, the proportion being increased by heavy feeding. Pound for pound, wheat seems to be worth about 20 per cent. less than corn, for fattening hogs. The wheat does not make as much live pork per bushel as corn, and the meat is not as solid. A thick, rich slop of ground wheat, supplemented by some corn, is better for fattening hogs. Work horses should have a mixture of equal parts of corn and wheat, of which they should be fed about three quarts. If fed to milch cows, as a slop, wheat enriches the milk, but does not increase the quantity very materially. Wheat is selling here for 42 cents and corn for 34 cents, at which prices it is more profitable to feed than to sell the wheat. The bran sold by the mills is of such a quality that it would not be profitable to exchange the wheat for bran at current prices, but it will pay to get the wheat ground, even when the toll is 10 cents per hundred pounds, as it is here. Farmers run their own grinders, to some extent, by wind power. Where the work is all hired, the following is the estimate of the cost of raising an acre of wheat in this section of the country, on \$10 to \$20 land:

Interest at 7 per cent. on \$10.....	\$0 70
Plowing.....	1 00
Seed.....	70
Drilling.....	25
Harvesting and stacking.....	1 15
Thrashing and binning.....	60
Total cost of 10 bushels.....	\$4 40

CHASE COUNTY.

James R. Jeffrey, Elmdale.—Fed to stock, at least 10 per cent. seems to pass without any mastication when used whole. Wheat does not appear to be as nourishing as corn, and when fed to hogs is 10 per cent. less fattening, pound for pound, than shelled corn. Wheat makes about 15 pounds of live pork to the bushel, but the meat is not as firm as that made from corn. Hogs do not seem to relish the wheat, and will not eat it as readily as other food. It is best to chop equal parts of wheat and corn and feed as a slop. Wheat chopped with corn or oats is fed to work

horses, but it does not maintain their strength as well as other grain. It is fed more sparingly than shelled corn—about a fourth less. Milch cows do not eat wheat with as good a relish as they do corn. For feeding horses of any kind or cattle, wheat is worth 25 per cent. less than corn. With corn at 30 cents, it would pay to sell the wheat. The public mills and farm mills charge 5 cents per bushel for grinding, which is a profitable outlay. Counting interest on land worth \$30, and the wear and tear of equipment, it costs about 60 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 50 cents; 20 bushels cost 40 cents; 25 bushels cost 38 cents; 30 bushels cost 35 cents; 35 bushels cost 33 cents per bushel. Straw is worth \$1 per acre.

CHAUTAQUA COUNTY.

J. H. Leedy, Cedar Vale.—Wheat in this county has been fed to farm animals. It seems to be as healthful and more nourishing than corn, and fed to hogs proves 25 per cent. more fattening, pound for pound, than shelled corn, and the meat of wheat-fed hogs seems to be satisfactory. The best hog ration is two parts of wheat and one of corn, ground and fed dry. Work horses are fed on wheat alone, but it must be ground and fed with care as to quantity. Fed about two-thirds as much ground wheat, horses thrive and fatten better than when fed corn alone. Wheat is a good milk ration, and for horses, milch cows and other cattle it is 33 per cent. more valuable than corn. Wheat is worth 45 cents and corn 35 cents here, at which prices it is more profitable to feed than to sell the wheat. At current prices, it would not be a profitable plan to exchange wheat at the mills for bran and shorts, but it pays to invest the 5 cents per bushel charged by the mills for grinding the wheat, rather than feed it whole. Counting interest at 7 per cent. and the wear and tear of equipment, it costs about 71 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 47 cents; 20 bushels cost 35 cents; 25 bushels cost 28 cents; 30 bushels cost 22 cents; 35 bushels cost 20 cents per bushel. I do not know of a farmer in this part of the county who is not feeding wheat, and who is not well pleased with the results. I have fed 2,500 bushels, while one of my neighbors has fed 300 steers on wheat. Straw has a value of about 75 cents per acre.

CHEROKEE COUNTY.

M. S. Stillson, Baxter Springs.—Wheat has been fed to farm animals, sometimes whole to horses, otherwise ground. Whole, fully 10 per cent. seems to pass without mastication. It appears as healthful as corn, and fed to hogs is 10 per cent. more fattening than shelled corn. It produces about 11 pounds of live pork per bushel, the meat being sweeter and frying away less in cooking than that made from corn. It is a very satisfactory food for pigs and growing hogs, but for fattening hogs it should be mixed with the same weight of corn chop. It is fed alone to work horses, either whole or chopped, and maintains the strength and flesh about the same as other grains. It is very satisfactory for feeding milch cows, keeping up the flow of milk and the cows in good order. For feeding horses, wheat is about 10 per cent. more valuable than corn; for milch cows, 25 per cent.; and for other cattle 15 per cent. The public mills charge 5 cents a bushel for grinding, and the increased value of the feed will cover it. On land worth \$20 per acre, it costs about 60 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 47 cents; 20 bushels cost 42 cents; 25 bushels cost 36 cents; 30 bushels cost 32 cents; 35 bushels cost 28 cents per bushel. I have fed wheat here for three years, some of it being the screenings, where we would clean by taking out more of the lighter grains, thereby raising the grade of the salable wheat. Last year we had a great deal of wheat injured by rust, and the mills and feed stores have kept a good supply of this chopped that has been sold at 5 or 10 cents above bran prices. Nothing equals wheat fed whole for winter food for fowls; it is a great egg-producing food.

CHEYENNE COUNTY.

B. F. Campbell, St. Francis.—When fed whole, 10 per cent. passes the animals unmasticated. It does not seem to be as nourishing or healthful as corn, and is worth 15 per cent. less for fattening hogs. The most satisfactory mixture for hogs is bran and shorts mixed and seasoned with salt for slop; fed in connection with soaked wheat or rye, it is excellent for brood sows. For work horses, half and half bran or chop with wheat proves the best, but hardly equal to oats, and when working hard they do not thrive on the wheat mixture. Wheat is worth 40 cents and corn 35, and the wheat can be more profitably fed than sold. To sell wheat at 40 cents and buy corn at 30 would not pay. I would exchange some wheat for bran, and mix with soaked wheat; grinding scarcely increases the value enough to pay expenses. Land is worth from \$5 to \$8. Wheat costs, per bushel, if the yield is 10 bushels per acre, 35 cents; 15 bushels, 27 cents; 20 bushels, 22 cents; 25 bushels, 20 cents; 30 bushels, 18 cents; and 35 bushels cost 15 cents per bushel. Straw is worth about \$1 per acre.

CLOUD COUNTY.

William Olson, Glasco.—The wheat fed to farm animals is mostly ground, but is sometimes used whole, soaked. Fed whole to horses and cattle, 25 per cent. passes unmasticated; but not so with hogs. It is as nourishing and healthful as corn, but not as fattening for hogs. For growing hogs, a mixture of one part wheat and two of corn made into slop proves satisfactory. Wheat makes firmer meat, but not so much lard as corn. For working horses, half and half is better than all corn, but they do not fatten as well as on oats. In feeding, I give one-fourth less wheat than corn, to guard against colic. Equal parts of wheat chopped with corn has been fed with most excellent effect. Wheat is worth 38 cents and corn 35, and at these prices can be more profitably fed than sold. To sell wheat at 40 cents and buy corn at 30 cents would not pay. From 3 to 5 cents per bushel is charged for grinding at the public mills, and the feeding value is greatly increased by grinding. Land is worth \$25 per acre. To raise 10 bushels of wheat per acre costs 60 cents per bushel; 15 bushels costs 50 cents; 20 bushels, 32 cents; 25 bushels, 26 cents; 30 bushels, 22 cents; 35 bushels, 18 cents per bushel.

COWLEY COUNTY.

Rufus Davis, Udall.—When fed whole, no more passes unmasticated than of any other grain. It is more nourishing than corn, produces more muscle, and is more cooling to the system. Fed to hogs, it is 20 per cent. more fattening, pound for pound, and should be fed in the form of a thick mush. About 12 pounds of live pork can be obtained from a bushel of wheat, and only 10 from a bushel of corn. Wheat is a better grain to grow and fatten hogs on, because it contains more of the elements of bone and muscle. Wheat and corn, mixed half and half and ground, is a good ration for producing fine-flavored meat which will be neither too hard nor too soft. Work animals fed with one part wheat and two parts oats, with the wheat chopped, do best, and horses stand harder work, but it does not produce the flabby, fat condition that corn does. As a full ration, about one-fifth less than corn is fed. Fed to milch cows, it produces more milk and of a better quality. Wheat has 20 per cent. greater value than corn for feeding horses, cows, and other cattle; the value of 45-cent wheat can be almost doubled by feeding to stock for market. To sell wheat at 40 cents and buy corn at 30 would be money out of a farmer's pocket; neither will the exchange of wheat for bran or shorts pay, as wheat alone will produce better results. Grinding increases its value 10 per cent. Horse-power mills of the "Monarch" style are used.

CRAWFORD COUNTY.

N. W. Taylor, Mulberry.—Some of the wheat crop of last year has been used whole, soaked, but as a rule has been ground. Nearly half passes unmasticated when fed whole. It is as nourishing and healthful as corn, and when fed to hogs proves as fattening, pound for pound. Leaving out the question of cost, the wheat fattens the hogs as fast or faster than corn, and the flesh is finer. At the beginning, it should only be given in moderate quantities, and soaked, as too much fed dry may cause constipation. The best hog feed I have found is two parts wheat one part corn, and one part oats. I mix equal parts of wheat, corn, and oats, and have a fine ration for work horses and milch cows. This keeps the horses up to their work and the hair lively on cows, while they give more milk. Wheat sells here for 40 cents per bushel, and corn for 35; it pays better to feed than to sell the wheat, even if the corn could be had for 30 cents. It costs 10 cents per hundred to get feed ground at the public mills, and the enhanced results warrant the expense. On land worth \$25, and counting interest at 7 per cent., labor, and wear and tear of implements, it costs about 65 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 50 cents; 20 bushels, 40 cents; 25 bushels, 35 cents; 30 bushels, 30 cents; and 35 bushels, 27 cents per bushel. While I think there is nothing quite equal to corn as a grain for animals, yet, with live pork at 5 cents per pound and beef 4 to 5, there is more money in feeding wheat than in selling it at 40 cents.

DECATUR COUNTY.

J. H. Sales, Norcatur.—About one-half of the wheat in this county has been fed to farm animals the past year. It is more nourishing and healthful than corn, and at the same price per bushel it is at least 20 per cent. more valuable for feeding hogs. From 15 to 17 pounds of live pork is about a fair average return from a bushel of wheat. Wheat and corn in equal parts, ground with one-eighth its weight in oil cake added, make the best feed that I ever used for young hogs. Wheat, with one fourth corn meal added, is a superior feed for milch cows. Wheat is selling here for 40 cents, and corn for 30 cents; but the wheat is worth 75 cents for feeding to young hogs. I would not consider it profitable to use bran costing 50 cents per hundred when I can get ground wheat at 75 cents per hundred. With the "Hero" mill, two men and four horses can grind about 100 bushels of feed in a day. Wheat land here is worth \$20 per acre. Counting interest and all wear and tear of implements, it costs about 60 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 50 cents; 20 bushels, 40 cents; 25 bushels, 35 cents; 30 bushels, 32½ cents; and 35 bushels, 30 cents. I am raising Poland-China swine, and I have found that I can get far better results from a mixture of 15 bushels of wheat and 10 of corn than from 35 bushels of corn, and the pigs are far more valuable as breeders. One feeder reports his experience, and my own confirms its correctness. He fed 2,500 bushels of corn in 1892, and the next year fed 1,000 bushels of wheat and 400 bushels of corn, mixed and ground fine, and secured the most pork from the 1,400 bushels of mixture.

DICKINSON COUNTY.

H. K. Burkholder, Holland.—The wheat of last year in this county fed to farm animals has been dry, soaked, cooked, but mostly chopped. When fed whole, about 40 per cent. seems to pass the animals without mastication. It is as healthful, and, when chopped or cracked, seems as nourishing as corn. Fed to hogs, it proves as fattening, pound for pound, as corn, and at least 30 per cent. more desirable, while for pigs one bushel of wheat is worth two of corn. Cracked and fed dry to horses, it is a very satisfactory feed, and with a less quantity they can be kept in good strength. It is 50 per cent. better than corn for feeding milch cows, and is good

for calves. Wheat sells here for 38 cents and corn for 30 cents, at which prices it is better to feed the wheat to the stock. From the feeder's standpoint it will not pay to exchange the wheat at the public mills for bran or shorts. Better chop the wheat or pay 5 cents for grinding. I use a "Stover" sweep "chopper," and a man and a team can chop 100 bushels per day. Allowing one-third for rent of land, it costs 35 cents per bushel to raise 20 bushels of wheat per acre. For over a year I have been feeding wheat, mostly to young hogs. I paid 5 cents per bushel for chopping, and with about half the usual quantity of feed obtained a vigorous growth. I then tried cooking, feeding the whole grain in a very soft condition, but over half of it passed the hogs without mastication. By mixing some corn with it, they would chew the wheat better. Then I tried chopping, and am still following that plan. Chopped (coarsely ground) wheat fed dry to horses is very good, but if ground too fine and fed damp the dough adheres to their mouths. The bran or hull of the wheat is very tough when wet, and, as very few animals will properly chew the whole grain, much of it must necessarily pass unmasticated.

DOUGLAS COUNTY.

John Manwaring, Lawrence.—The wheat in this county, fed to farm animals, is used in every form, and is said to be as nourishing and healthful as corn. For hogs, it is good for fattening, and has proved very satisfactory. For horses, it is ground and fed with corn chop. Grinding costs 10 cents per 100 pounds at the public mills, and the feed is much improved when ground and made into slop. To raise 10 bushels per acre, it costs 62 cents; 15 bushels, 42 cents; 20 bushels, 33 cents; 25 bushels, 27 cents; 30 bushels, 23 cents; 35 bushels, 20 cents per bushel. Wheat straw is worth \$1 per acre, and land \$25 to \$50 per acre. The table following will show the cost of raising 10 bushels of wheat; the expense of labor is the same for 10 bushels as for 35 per acre. A greater yield per acre will be the same in expense as 10 bushels only, adding 4 cents for every additional bushel for thrashing.

For plowing an acre.....	\$1 00
Harrowing.....	10
Drilling.....	20
Seed, at present prices.....	50
Cutting and putting in shock.....	1 25
Thrashing, at 4 cents per bushel.....	40
Labor in thrashing.....	17
Interest on land worth \$30 per acre.....	2 10
Wear and tear of equipment.....	50
Total	\$6 22

ELLSWORTH COUNTY.

G. W. Clawson, Ellsworth.—In November, 1893, I put on a full feed of wheat about 800 head of Panhandle, Texas, steers, and fed them for a period of four months. These steers were from ranges where they were unused to grain food of any kind. They were fed a mixture consisting of about 60 per cent. corn and 40 per cent. wheat, chopped or ground coarsely on a horse-power grinder. I have had, for the last eight years, experience covering the same months each year in feeding about the same number and quality of Western steers. During the prior feeding seasons I fed corn entirely, usually shelled. My experience in feeding the mixed food was entirely satisfactory, both as to the quickness of time in which I could get the animals to rightly take hold of the food, and also as to the results obtained; and I have no hesitancy in saying that steers fed on a mixture of wheat and corn, in about the above proportions, will gain pounds a great deal faster than on corn alone. During the season, I fed 9,000 bushels of wheat of my own raising, in this county. About half of this was fed to cattle, as stated; the remainder was ground coarsely and fed direct to hogs, in the nature of slop. Careful experiments showed

that a bushel of dry corn put on 14 pounds of pork, and a bushel of wheat ground and fed as slop made 17 pounds.

I am this year feeding, on this same farm, 16,000 bushels of wheat; 4,000 bushels of this was of my own raising, and 12,000 bushels were purchased locally, at prices ranging from 28 to 37 cents per bushel, or at an average price of 35 cents. I had on the Kansas City market, a short time since, a car load of pigs, fattened entirely on wheat, which brought \$6.10 per hundred, and averaged 249 pounds. These pigs never knew the taste of corn.

I have at this time more than 1,600 head of hogs of my own raising. These comprise fattening hogs, pigs of all ages and descriptions, stock hogs, and breeding hogs; and, during the last 10 months, I have fed no corn whatever, nor do I expect to as long as I can buy wheat at or about the same price as corn. All ages and grades of hogs appear to thrive better on wheat than on corn. My hogs have been entirely free from disease. Where a bushel of wheat, costing 35 cents, puts on 17 pounds of 6-cent pork, there can be no question of the profitableness of wheat feeding. For feeding wheat to hogs, I advise grinding the grain coarsely and soaking it, and using as a slop. I have fed some dry, whole wheat to hogs, but feel confident that, owing to defective mastication, better results can be obtained by grinding and soaking. I consider wheat superior to corn as a food for hogs, and that a bushel of wheat will put on at least 10 per cent. more in weight than a bushel of corn.

ELK COUNTY.

W. S. Brundage, Oak Valley.—When fed whole, about 25 per cent. seems to pass the animals unmasticated. The wheat ration seems as nourishing as shelled corn. When fed to hogs, it produces about 10 pounds of pork to the bushel, and, for fattening, seems a little better than corn, and the meat is about as good, but, perhaps, not quite so solid as corn-fed pork. My best results have been obtained from feeding equal parts of wheat and corn and a little oil cake. Nothing is quite so good for work horses as oats, but the next best feed is wheat and a little oil cake. My horses thrive and fatten on that ration better than on corn alone. Wheat is the best feed for milch cows; but for putting on flesh, I can get the best results from corn meal and oil cake. Wheat is worth 45 cents here, and corn the same, at which prices it is better to feed than to ship the wheat. The bran and shorts we get at the mills are really higher than the wheat, and we can get our grinding done on "Victor" and "Little Giant" farm mills for about 4 cents per bushel. On land worth \$40 per acre, it costs me to raise 10 bushels of wheat on an acre as follows:

Interest on land	\$2 80
Plowing.....	1 00
Harrowing and drilling.....	75
Seed, 2 bushels.....	1 00
Cutting and thrashing, 10 bushels.....	2 25
Wear of tools.....	20
Total	\$8 00

On this basis, 10 bushels cost 80 cents per bushel; 15 bushels cost 56 cents; 20 bushels, 47 cents; 30 bushels, 36 cents per bushel.

FORD COUNTY.

J. L. Finley, Dodge City.—Some of it has been fed dry, but most of it is now soaked, as nearly a fourth of the dry grain passes unmasticated. It is nearly as nourishing as corn, and is as healthful but not as fattening for hogs, being worth about 25 per cent. less than corn for that purpose. The meat of wheat-fed hogs is better than that of corn-fed, being firmer and containing less fat. For feeding hogs, the wheat is much improved by adding at least a fourth the quantity of corn meal. Horses do well on soaked wheat, but do not fatten as well as when fed corn

or oats. It is good for milch cows, but worth 10 per cent. less for other cattle. Wheat sells here for 40 cents and corn for 45 cents per bushel, and as long as prices remain anywhere near these figures it will pay to feed the wheat. If not too long a haul, I would exchange some wheat for bran and shorts at the mills, but I do not think the work of grinding chop for all the feeding pays for the trouble and expense. On land worth \$5 per acre, it is worth 60 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 50 cents; 20 bushels, 45 cents; 25 bushels, 40 cents; and 30 bushels, 30 cents per bushel. Wheat is a better crop in this portion of the state than corn, and if it remains as low in price as at present there will be a large quantity fed. It is better for poultry and milch cows, and when ground is excellent for pigs and young hogs. Corn is better to finish fat hogs and beef cattle. The straw has a value of about \$1 per acre.

FRANKLIN COUNTY.

C. H. Estabrook, Ottawa.—Our experience in feeding wheat has been confined almost exclusively to hogs. We grind it and find it as nourishing and as healthful as corn, and, when fed to hogs, produces from 15 to 18 pounds of pork to the bushel. I consider it about 50 per cent. more valuable than corn for that purpose, and the meat made from wheat-fed hogs is better than that made with corn, but the best results are to be obtained by feeding wheat and corn together. Wheat is worth 50 cents and corn 30, at which prices I can feed my wheat at greater profit than to sell it and buy corn. We have a farm mill, and, by grinding our own feed at times not otherwise occupied, we spend no more time than it would take to go to the mill, and we have the price charged for grinding saved. It is better to grind than to exchange for mill stuffs, as then you know just what you are getting. My last crop of wheat was grown on land worth \$25 per acre, and the average yield was 18 bushels, which cost me, in the bin, just 27 cents per bushel, not reckoning anything for interest on investment.

GEARY COUNTY.

J. P. Fall, Junction City.—By experimenting, we found that a very large percentage passed the animals unmasticated, if fed whole; therefore, grinding and soaking were resorted to, and the results have proven very satisfactory, it being as nourishing and healthful as corn. Ground and made into a slop, is excellent for brood sows and pigs. My work horses have been fed ground wheat, and kept in fine condition, both as to flesh and strength, using about one quart to a feed. I have fed about 2,000 bushels of wheat to cattle the past winter, mixing about one bushel of ground wheat with four of shelled corn, and I never had stock to do better. Have used oil cake for 10 years, but prefer wheat to the new-process oil cake. I would feed wheat rather than sell it at 50 cents; I have none for sale at that price, except in the form of live stock. The exchange of wheat at the mills for bran or shorts is very unprofitable, for they largely consist of hulls and dirt. The value of the feed, when ground, is increased more than enough to pay for the grinding, which is 5 cents per bushel at the public mills.

GRAHAM COUNTY.

G. Godard, Morland.—I am feeding my stock wheat, but always ground, and find it as nourishing and healthful as corn. Fed whole, from 10 to 20 per cent. passes unmasticated. For hogs, I find that wheat (60 pounds) is a little better than corn (56 pounds). It is better for fattening hogs to mix about half corn, and grind, and soak it in not too much water. For my work horses, I mix corn and wheat, and grind, of which I feed about a third less than I would of shelled corn. This ration is just as good for milch cows as corn; but my notion is that chopped corn contains more heat, and that is what the cow must have to give milk. Wheat and corn

are worth 40 cents here, and with corn at 30 cents I do not believe it would pay to sell the wheat and buy corn, at least not for horses. I believe it will pay to sell the wheat and buy bran or shorts, as a ton of wheat will bring \$13.25, and a ton of bran or shorts can be had for about one half that amount. I have a "Peerless" mill on my farm, and get 4 cents for grinding, or one-eighth toll. On \$5 land, it costs 60 cents per bushel to grow 10 bushels of wheat per acre; 15 bushels, 55 cents; 20 bushels, 50 cents; 25 bushels, 45 cents; 30 bushels, 40 cents; and 35 bushels, about the same. I will say parenthetically, that I have some conscientious scruples about feeding wheat to stock, except in cases of great emergency, as it was by nature intended as food for the human family.

HARVEY COUNTY.

W. M. Congdon, Sedgwick.—Wheat in this county fed to live stock was mostly ground, and some soaked, but none dry and whole. It appears to be more healthful than corn, and when fed to fattening hogs makes about 15 pounds of pork to the bushel. My experience and that of my neighbors who have tried feeding it as I do is, that, at present prices of stock, we realize from 75 to 90 cents per bushel for our wheat. The best plan is to feed the clear wheat to pigs and growing hogs, ground and in the form of a slop, but for fattening hogs we grind together one part corn and two parts wheat. To my work horses I have fed the wheat alone, and in various proportions with oats and corn, but do not feed as heavy a ration of the wheat. They thrive and fatten as well as on other feed. The wheat fed to milch cows increases the flow of milk and keeps up the quality. At the same price per bushel, I estimate that wheat is 25 per cent. more valuable than corn for feeding horses, 50 per cent. more for milch cows, and 25 per cent. more for other cattle. It is now selling here for 38 and corn for 32 cents per bushel, at which prices I would never ship or sell the wheat to millers. With wheat at 40 and corn at 30 cents per bushel, I would not haul both ways to sell the one and buy the other, nor would I sell the wheat to the mills for bran or shorts. It costs us 5 cents per bushel to get our feed ground, and this expense is more than overcome by the good results. Some of our farmers have wind- and horse-power mills, and do their own grinding, at a small expense. On land worth \$25 per acre, it costs me 50 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels, 40 cents; 20 bushels, 37 cents; 25 bushels, 35 cents; 30 bushels, 32½ cents; and 35 bushels, 30 cents per bushel.

JACKSON COUNTY.

J. E. Hoagland, Whiting.—For hogs, I feed one part of wheat, as a slop, to three parts of corn, fed whole, and get best results. For work animals, I use equal parts of wheat, oats, and corn, ground and fed damp with cut hay or straw, and consider it a grand ration. Wheat is worth 40 and corn 30 cents per bushel, at which prices I prefer to sell the wheat and buy corn. Land worth \$35 per acre here will produce 10 bushels of wheat at a cost of 64 cents per bushel; 15 bushels, 46 cents; 20 bushels, 32 cents; 25 bushels, 31 cents; 30 bushels, 28 cents; and 35 bushels, 26 cents per bushel. For 25 years I have used wheat as feed for farm animals, but always as a slop. Weight for weight, I consider shorts better than whole wheat. I am now feeding ground wheat that cost me 75 cents per 100 pounds, and shall next buy shorts at 80 cents per 100 pounds for my hogs. I consider bran better than shorts for milch cows. This is not a wheat-raising country, and the wheat which is being fed is mostly by small farmers, who raise but a small quantity.

JEFFERSON COUNTY.

James Mains, Oskaloosa.—It has been mostly ground, and soaked from 6 to 10 hours, for the reason that if fed whole about half passes unmasticated. It is found

to be as nourishing as any other grain, and more healthful than corn. For young stock, it is the best that can be used, and for pigs and shoats it is excellent, also for fattening hogs; it makes from 13 to 15 pounds of good pork to the bushel, but I like a little corn for finishing the hogs. My best feed for fattening hogs is equal parts of wheat and corn, ground, with about 15 pounds of oil meal added to each 100 pounds. A mixture of equal parts of wheat and corn will keep horses healthy and in good spirits, and this same mixture will increase the flow of milk, when fed to cows. For the latter purpose, it is worth at least 30 per cent. more than corn. Wheat is worth 40 cents here and corn 30, and the wheat can be fed with more profit than sold. Public mills charge 5 cents per bushel for grinding. Many farmers have wind- and horse-power mills. The bran and shorts from flouring mills are too high priced and not what we want; it pays to have the wheat ground. On land worth \$30 to \$35 per acre, I can raise 10 bushels of wheat per acre at a cost of 67 cents per bushel; 15 bushels cost 47 cents; 20 bushels, 37 cents; 25 bushels, 31 cents; 30 bushels, 29 cents; 35 bushels, 26 cents per bushel. This is on the basis of hiring all the work done, but where a man does all his own work he can reduce the cost about 25 per cent. Ground wheat is good to mix with any other grain, and in that way can be fed to any kind of stock at a profit, at present prices. Straw is worth about 75 cents per acre.

JEWELL COUNTY.

B. H. North, Glen Elder (Mitchell county).—Wheat is not as nourishing as corn for hogs, and, pound for pound, proves only about half as good for fattening. Corn and wheat, mixed, about half and half, make the best feed for hogs. Horses are not fed on wheat alone, as it requires much more to keep them in condition. Wheat, ground and fed with bran, is first class for milch cows. Wheat sells here at 40 cents and corn at 30 cents, at which prices it will pay to sell the wheat. There is too much dirt and trash in the bran which millers exchange for wheat to keep the stock in good condition. The public mills charge 7 cents per bushel for grinding, and, for feeding brood sows and pigs, the expense is more than justified by the increased value of the feed. The cost of raising an acre of wheat in this county, when all the work was hired, has been as follows:

Interest (or rent of land).....	\$2 00
Plowing, including board of hand.....	80
Harrowing.....	15
Seed, 1½ bushels.....	55
Drilling.....	25
Cutting and hauling to machine.....	1 00
Thrashing, 10 bushels.....	35
Hauling to bin.....	10
Board of hands.....	08

Total cost of raising 10 bushels..... \$5 28

The cost per bushel for raising 10 bushels per acre is therefore about 53 cents; 15 bushels, 36 cents; 20 bushels, 28 cents; 25 bushels, 23 cents; 30 bushels, 20 cents, and 35 bushels, 17 cents per bushel. Straw is worth perhaps 25 cents per acre.

LEAVENWORTH COUNTY.

Matthew Gray, Hoge.—Considerable poor wheat has been fed to farm animals this season. The result has been about the same, whether fed whole or when ground and soaked. Our land worth \$25 per acre, the expenses of growing an acre of wheat has been to me as follows:

Rent.....	\$2 00
Plowing, harrowing, drilling.....	1 90
Seed.....	75
Cutting and shocking.....	1 25
Stacking.....	75
Thrashing and handling (10 bushels).....	1 00
Total.....	\$7 65

On this basis, it will be seen that a yield of 10 bushels per acres costs me 75 cents per bushel; 15 bushels cost 55 cents; 20 bushels, 43 cents; 25 bushels, 37 cents; 30 bushels, 34 cents, and 35 bushels, 30 cents per bushel.

LINCOLN COUNTY.

Bredes & Minx, Lincoln.—We are feeding wheat extensively, mixing about three parts corn and one part wheat. One bunch of steers is consuming about 125 bushels of this mixture per day, ground and fed dry. We are satisfied that this is worth 25 per cent. more for feeding steers than corn would be if fed alone. For work animals, it is better than shelled corn; they thrive and keep up their strength on it better than on corn. Wheat, at the present time, is worth 35 cents here, and corn 32 cents, at which prices the wheat can be fed to farm animals at more profit than sold to millers. We do not care to exchange any wheat for the bran or shorts at the mills. We use wind, steam and horse power, and grind our feed at the nominal price of about 1 cent per bushel.

MARION COUNTY.

Thos. M. Potter, Peabody.—Wheat fed to farm animals here is either ground or soaked, and appears to be as nourishing and healthful as shelled corn, and, pound for pound, produces as much pork, averaging about 10 pounds per bushel. Leaving cost out of the question, I have found it as satisfactory for growing or fattening hogs as corn, and the flesh of the wheat-fed hogs is as good as that produced by other staple foods. For work animals, I mix equal parts of corn or oats, and my horses thrive and fatten, the ration being about the same in quantity. It costs approximately 65 cents a bushel to raise 10 bushels per acre of wheat, on land worth \$25, counting the straw of each acre worth about 50 cents; 15 bushels cost 45 cents; 20 bushels, 35 cents; 25 bushels, 27 cents, and 30 bushels, 22 cents per bushel. Wheat is worth here 37 and corn 35 cents per bushel. At these prices, it is as profitable to feed as to sell the wheat, but I cannot exchange it for bran or shorts on terms at all advantageous. It costs but little, perhaps $2\frac{1}{2}$ cents per bushel, to grind into a chop, and the better results obtained much more than offset the expense.

MARSHALL COUNTY.

C. B. Thummel, Axtell.—June 1, I put in a dry pen 20 hogs, weighing 3,850 pounds, or an average of $192\frac{1}{2}$ pounds—good, thrifty ones, out of feed lot and pasture. They were put on wheat of poor quality (possibly No. 3), soaked 12 hours. It was fed in clean troughs three times a day, with good drinking water. They had no other food or slop of any kind. They were weighed as follows: June 1, 3,850 pounds; June 8, 4,080; June 15, 4,300; average gain, 30 pounds; daily gain, $1\frac{1}{2}$ pounds. I was then called from home, and gave the care of the hogs to a trusty man, who put them on soaked corn, and fed as before for 14 days, with the following results: June 15, they weighed 4,300 pounds; June 29, 4,520; gain, 220 pounds; daily gain, three-fourths of a pound per head. It seemed to me that that man took better care of the hogs than I did. I was sorry that the test was not made all under one man's feeding, but you have the results, and can draw your own conclusions. I certainly was surprised at the results. I wished to find out by actual test what wheat was worth, as the average farmer would feed it. With hogs selling at $4\frac{1}{2}$ cents per pound, the wheat netted 50 cents per bushel.

I think that the wheat should be ground, as hogs do not chew it long enough to get the full benefit. Much of the wheat passed off whole—from one-fifth to one-fourth, I should judge. I might add, that had these hogs not been taken off grass, the results as to pounds gained would have been largely increased, as they had been running out and had grass and water. Putting them in a close pen, deprived of running water and grass, the change was severe, as the weather had grown very hot.

I had considerable old wheat on hand, and wished to ascertain whether it was best to sell the wheat and buy corn or feed wheat. I think that any farmer had better feed wheat than sell at less than 50 cents per bushel, with hogs and cattle at 4 to 4½ cents per pound. At present prices for hogs and cattle, wheat should, as fed by the average farmer, be worth 75 cents per bushel, at least. I have also fed some cattle on wheat. They were put on wheat and one-fourth corn, ground together in a common sweep cob-and-corn grinder. Much of the wheat remaining whole, in order that cattle might get the best results, I added corn cobs and ground all together. The cobs were added to keep the cattle from scouring, and it was a great success.

In order that the reader may fully understand, I will give a short history of the cattle: I call them my "baby cattle," as they were only yearlings, mostly full-blood Shorthorns, 15 head. They were put on feed April 1, last; had been well wintered, but with no view of such early fattening. I wished to see what young steers were worth as feeders; whether it was best to feed at a year old, or grass through and wait until they were two years old. April 1 (the day they received their first feed), the little cattle averaged 500 pounds.

The 15 head weighed: April 1.....	7,500 pounds.
April 15.....	8,080 "
April 26.....	8,180 "

Then two steers were added, and all turned on grass. The steers added were six months older; had been in feed lot four months, and were also full bloods; their weight was 1,950 pounds; the cattle now had pasture to themselves, 15 acres, and feed box in the pasture, with feed continued. The feed was ear corn crushed or ground, cob and all.

The 17 head weighed: April 26.....	10,130 pounds.
June 17.....	12,830 "
August 15.....	14,540 "

A gain of 300 pounds per steer for 137 days' feed—very good for calves. August 15, I put the cattle on ground wheat and corn; the weather had become very hot and dry; the grass had dried up, the water was poor and warm, and flies troublesome.

August 15, they weighed.....	14,540 pounds.
September 7, they weighed.....	15,630 "

A gain of 1,090 pounds in 22 days, or a daily gain of nearly three pounds. We have results as follows: 159 days' feeding gave 6,180 pounds, or an average gain of 364 pounds per head. These cattle were weighed in the morning each time, as nearly as possible under the same circumstances. The design of their feeding is to make Christmas cattle of the little fellows, feeding to December 10, noting results, their cost, and the price they bring. Every farmer I talk with is more than satisfied with the results of feeding wheat, and if wheat and corn remain together in price, the Kansas wheat crop of this year will largely be fed to stock. I know of one man who thrashed out 5,000 bushels of No. 1 wheat, and says he will feed the last bushel, unless he can sell for more than 50 cents per bushel. All feel the same; they would rather sell what corn they have and feed wheat at present prices.

MIAMI COUNTY.

A. W. Crawford, Bucyrus.—Wheat in this county last year fed to farm animals was used chiefly whole and soaked. When fed whole, about 50 per cent. passes without mastication. It does not appear as healthful and nourishing as corn; fed to hogs, it proves 10 per cent. more fattening, pound for pound, than corn, but the best plan is to mix half and half with corn. Wheat is worth 40 cents and corn 30. For hogs, it will pay better to feed than to sell the wheat. For cows, it would be profitable to exchange some of the wheat for bran or shorts. The public mills charge 10 cents for grinding wheat, and the increased value more than covers this.

On land worth \$40 per acre, it costs about 80 cents per bushel to raise 10 bushels per acre; 15 bushels, 65 cents; 20 bushels, 55 cents; 25 bushels 50 cents. It requires very careful feeding to make stock thrive any great length of time on wheat. Hogs, and horses also, will eat heartily of it for two to four weeks, and then they need a change to grass, corn or oats, after which they can be successfully brought back to wheat. I have the best results from feeding wheat in the sheaf to stockers, as in that manner they never get a surfeit.

MITCHELL COUNTY.

William Kettler, Beloit.—Whole, about 10 per cent. passes without chewing. It is as nourishing and healthful as corn, and much more so for young hogs. At the same price, wheat is worth 20 per cent. more than corn for hogs. For young hogs, there is nothing equal to it, but for fattening, one part corn and two parts wheat is the most satisfactory. Work horses are fed ground wheat, but when not ground it is mixed with something coarser and lighter in quality; but they will do better work and come out looking better if fed on oats and corn. Ground wheat is superior feed for cows in milk. Wheat sells here for 35 cents and corn for 30 per bushel, at which prices it is more profitable to feed than sell the wheat. If wheat could be sold for 40 cents, it would not be profitable to haul both ways to sell wheat and buy corn. For feeding everything but hogs, it might be better to exchange the wheat for bran and shorts, at current prices. Public mills charge 5 cents per bushel, and farm mills about 3 cents, for grinding wheat, and its value for feed is increased enough to pay the expense. Computing 7 per cent. interest on \$15 land, labor, and wear and tear, it costs about 50 cents to raise one bushel of wheat when the yield is 10 bushels per acre; 15 bushels, 38 cents; 20 bushels, 31 cents; 25 bushels, 26 cents; 30 bushels, 24 cents; 35 bushels, 22 cents per bushel. Straw is worth 25 cents per acre. During 22 years' farming in this county, this is the fourth year I have fed wheat, but have never fed good wheat to farm animals when corn was plentiful; this year I am feeding about 1,000 bushels.

MORRIS COUNTY.

J. S. Loomis, Diamond Springs.—When fed whole, 20 per cent. passes without mastication. Ground wheat appears as healthful and nourishing as corn, and, fed to hogs, it produces about 15 pounds of live pork per bushel, the flesh being equal to that from corn. Until pigs are six months old, there is nothing equal to ground wheat for feeding them, summer or winter, but after that age they should have half and half wheat and corn, ground together. Wheat fed to horses puts on fat, but does not maintain their strength equal to corn. Only one-half as much wheat is required for a ration as is used of corn. For feeding milch cows, it is ahead of corn, pound for pound. Wheat is selling here for 40 cents and corn for 30, at which prices it is far more profitable to feed the wheat. It is not profitable to exchange the wheat at the mills for bran and shorts at current prices of each, as these do not fatten; they increase the milk, but not the butter. The public mills charge 4 cents per bushel for grinding, and the value of the feed is increased more than enough to cover the expense. On land worth \$30 per acre, and counting labor and wear and tear of equipment, it costs to raise an acre of wheat about as follows, hiring the labor done:

Interest.....	\$2 10
Plowing.....	1 00
Harrowing.....	20
Seed.....	50
Drilling.....	40
Harvesting.....	1 00
Thrashing 10 bushels.....	80
Total.....	\$6 00

This gives the cost of 10 bushels at 60 cents per bushel; 13 bushels, 44 cents; 20

bushels, 35 cents; 25 bushels, 29 cents; 30 bushels, 25 cents, and 35 bushels, 21 cents per bushel. The wheat straw is worth \$1 per acre. I have fed wheat for three years, and now have the bulk of two crops on hand, and will feed the most of it. I can soak ground wheat three or four days in winter, and one or two days in summer, and realize \$1 per bushel by feeding to 5-cent pork. In May of last year I began feeding 14 young pigs; gave them nothing but wheat, and at eight months old sold them, weighing 304 pounds each. Other pigs, with all the corn they wanted, were sold at 11 months, weighing 230 pounds each.

OTTAWA COUNTY.

J. T. White, Ada.—A large percentage of the wheat fed whole passes the animals unmasticated. Ground wheat is as healthful and nourishing as corn, and, when fed to hogs in the form of swill, it is 25 per cent. more fattening than corn, pound for pound. It is very satisfactory for growing hogs, but the meat from wheat-fattened hogs is not as solid as that from corn. Ground wheat is fed to work horses, and seems to maintain strength and flesh about as well as corn, when using but two-thirds the quantity. For milch cows, it is the best food known, being worth 40 per cent. more than corn at the same price. Wheat and corn are both selling here for 40 cents per bushel; and, if corn was selling at 30 cents, it would not pay the farmer to sell his wheat and buy corn to feed, hauling both ways; neither would it be any profit to him to sell wheat and buy bran or shorts at current prices, but he would improve the value of his feed fourfold by having the wheat ground at the public mills, costing only 4 or 5 cents per bushel. Counting interest on \$20-per-acre land, with the wear and tear of equipment, and all labor, it costs about 72 cents per bushel to raise 10 bushels of wheat per acre; 15 bushels cost 52 cents; 20 bushels, 42 cents; 25 bushels, 35 cents; 30 bushels, 31 cents, and 35 bushels will cost 29 cents, put in the bin. Wheat straw is worth about 60 cents per acre. In fattening cattle, it is often very difficult to prevent them from scouring, when fed on corn or corn chop exclusively; by using one part of wheat and two parts of corn chop, this trouble is almost entirely obviated. I have known several hundred steers to be fed in this manner without the scouring of a single animal. Cattle feeders who have used wheat for two years think it is worth 60 cents per bushel for fattening cattle, selling them not lower than the present range of prices.

PAWNEE COUNTY.

J. B. Brown, Larned.—When fed whole, about 10 per cent. is voided without being masticated. Wheat appears to agree as well as corn with hogs; proves 10 per cent. more growthful. The flesh of the wheat-fed hog is not as solid as if made from corn alone, and the last three or four weeks of fattening, corn should be used alone. Wheat is fed, soaked, to work horses, and they thrive and fatten better than on corn, being fed about the same quantity. It is worth, in this market, 38 cents and corn 40 cents per bushel. If the wheat was selling for 40 cents and corn for 30 cents per bushel, it would be profitable for the farmer to sell his wheat and buy corn. At equal price per bushel, they will give about equal results, but 10 cents is too much difference for feeding purposes. The feeder would, in some instances, make a profit by exchanging his wheat at the near-by mills for shorts, at current prices. The public mills charge 8 cents per hundred for grinding wheat, but the improved quality of the feed will not warrant this expense. The estimate of the cost of raising an acre of wheat yielding 10 bushels is as follows:

Plowing.....	\$1 00
Seed.....	60
Drilling.....	30
Cutting.....	1 00
Thrashing.....	70
Boarding.....	20
Interest on land worth \$20 per acre.....	1 40
Total cost of raising 10 bushels.....	\$5 20

On this basis, 10 bushels cost approximately, 52 cents per bushel; 15 bushels cost 37 cents; 20 bushels, 29 cents; 25 bushels, 25 cents; 30 bushels, 22 cents; 35 bushels, 20 cents.

RUSSELL COUNTY.

J. G. McKeen, Russell.—Farmers of this county have fed about 15 per cent. of the small wheat crop of last year to farm animals. It has been ground, except where fed to poultry. Fed whole, about 25 per cent. passes the animals unmasticated. Wheat is healthful and, to some animals, as nourishing as corn, but, for hogs, it proves 20 per cent. less fattening, pound for pound, than corn. Leaving out the question of price, wheat is worth about as much as rye for feeding young hogs and pigs, if ground and fed in a slop. The pork from wheat-fed hogs is leaner, and not so oily. To fatten properly, hogs should be fed the last two months before marketing on corn or Kaffir corn. A good mixture for hogs is two parts wheat and one part corn or Kaffir corn. Equal parts of chopped wheat and oats or chopped corn, fed in quantities about three-fourths as much as of corn, make work horses thrive and keeps up their strength better than corn alone. Wheat is not as good as corn to keep up the flesh on work animals. Ground wheat is better than corn for milch cows. For feeding horses, it is worth about 30 per cent. more than corn, at the same price per bushel; for milch cows, it is worth 50 per cent. more; for other cattle, it is worth 40 per cent. more, if fed for growth, and 20 per cent. less if fed to fattening cattle. Wheat is selling for 40 cents and corn for 42 cents per bushel, which forces the farmers to feed the wheat. With corn at 30 cents per bushel, it would not be profitable to sell wheat and buy corn. At current prices, the mill should be very near by to make it profitable for a feeder to sell wheat and buy bran and shorts. The public mills charge 5 to 7 cents per bushel for grinding wheat, but the grinding can be done at home in less time than is required to haul the wheat to mill. Farmers use the "Blue Valley" and other sweep mills, and the expense of grinding at home or elsewhere is more than overbalanced by the good results. On wheat land worth \$10 per acre, it costs about 45 cents per bushel to put 10 bushels per acre in the bin; 15 bushels, 37 cents; 20 bushels, 32 cents; 25 bushels, 26 cents; 30 bushels, 22 cents, and 35 bushels cost 21 cents per bushel. When wheat is drilled in among corn, the cost will be about \$1.10 per acre less than the above. Straw is worth 20 cents per acre to sell and 50 cents to feed. To raise wheat solely for feed is not profitable, but at present prices it is better to feed than sell. I have always fed it when the price dropped below 50 cents, and it has paid well when it was profitable to feed any grain. Rye is a more certain crop, and as good feed for hogs, but not for milch cows. Should present prices continue, farmers must stop raising wheat unless they can feed it to live stock.

SEDGWICK COUNTY.

C. H. Bardshar, Mount Hope.—About 25 per cent. passes the animals unmasticated if fed whole. Wheat is more nourishing than corn for growing hogs or other young stock; but for matured animals it is better to mix with corn, oats, or bran. For a general hog feed, wheat is worth about 20 per cent. more than corn at the same price. The flesh from wheat-fattened hogs is fully equal to that made from corn. A mixture of ground wheat and corn with bran is a superior ration for horses; but wheat alone is not equal to oats. The wheat ration should be about three-fourths that usually fed of corn. Fed to cows, it increases the flow of milk, but not the yield of butter; neither is the grain of the butter considered quite as good. Wheat is worth the same as corn at the same price for feeding horses, and 10 per cent. more for milch cows. The market value here for corn is 35 cents, and wheat is 40 cents, at which it will not pay to sell the wheat. It would be profitable

for a feeder to sell wheat and buy bran and shorts to mix with ground wheat. The mills charge 5 cents per bushel for grinding, and it improves the value of the feed more than enough to pay that expense. Some farmers use the "Challenge" wind-mill and grinder, and the cost of grinding is reduced to a very small sum per bushel. Land is worth \$30 per acre, and, counting interest, labor, and wear and tear, it costs about 65 cents to raise 10 bushels per acre of wheat and put it in the bin; 15 bushels per acre costs 46 cents; 20 bushels, 36 cents; 25 bushels, 30 cents; 30 bushels, 26 cents; 35 bushels, 21 cents per bushel. Straw is worth from 50 to 75 cents per acre for feed. I have fed about 1,500 bushels of wheat, and find that for fattening young hogs seven or eight bushels will go as far as 10 bushels of corn, and for feeding young pigs it gives still better results. I have fed 15 milch cows wheat and corn ground together, to which is always added bran, when I can buy at less than \$18 per ton. I do not like wheat for work horses, except mixed with corn, oats, or bran.

SHAWNEE COUNTY.

Thomas Buckman, Topeka.—Wheat appears as healthful and nourishing as corn, but, when fed to hogs, is about 10 per cent. less fattening. Mixed and ground with corn, it is a superior food for brood sows and pigs. Horses do not thrive and fatten on it as they do on corn. Wheat is worth 45 cents and corn 30 cents per bushel, which would not suggest to the feeder any profit in feeding wheat. It might be profitable for the feeder to sell wheat and buy bran or shorts for feeding milch cows, but not for fattening purposes. The public mills charge 4 cents per bushel for grinding wheat into feed, and I have thrown aside our "Keystone" grinder and take the wheat to the public mills. On land worth \$30 per acre, and counting interest, labor, and wear and tear of equipment, it costs here about \$1 per bushel, in the bin; to raise 10 bushels of wheat per acre; 15 bushels, 70 cents; 20 bushels, 55 cents; 25 bushels, 46 cents; 30 bushels, 40 cents; and 35 bushels, 35 cents per bushel. Straw is worth \$2.50 per acre. While wheat is a good feed for young and growing animals, the question now is, can we afford to raise wheat for feed when we can raise two bushels of corn as easily as one of wheat, the latter having no greater feeding value? For variety, had we not better buy bran to mix with chopped corn?

SHERMAN COUNTY.

Enos Bowman, Goodland.—A large portion of the wheat passes without mastication when fed whole. It is healthful and as nourishing as corn for young and growing stock, but, fed to hogs, proves 25 per cent. less fattening than corn, making 10 pounds of live pork per bushel, which has hardly as much lard as that from corn. Wheat is ground and mixed half and half with corn meal and fed to work horses, and maintains their strength and flesh as well as corn when fed the same amount. Fed to milch cows, wheat is better for milk than corn, but not so good for fattening purposes. It is 10 per cent. more valuable than corn, at the same price, for feeding milch cows, and for other cattle it is worth 10 per cent. less. Wheat is selling here for 45 cents and corn at 40 cents per bushel, at which there seems to be very little profit in feeding, and if the corn was 10 cents cheaper than wheat, it would be profitable to sell wheat and buy corn, hauling both ways. Bran and shorts are entirely too high to be bought by selling wheat at present prices, but it would be profitable to pay 7 cents per bushel for grinding wheat for feed. With land worth \$10 per acre, it costs about 30 cents per bushel, in the bin, to raise 10 bushels of wheat per acre; 15 bushels, 25 cents; 20 bushels, 24 cents; 25 bushels, 23 cents; 30 bushels, 22 cents; 35 bushels, 20 cents. I raised a bunch of pigs on skim milk, bran, and shorts, and finished them on ground wheat, and at six months and six days old they averaged 250 pounds.

SUMNER COUNTY.

T. A. Hubbard, Rome.—About 20 per cent. passes unmasticated when fed whole; soaked or ground, it is found to be as nourishing and healthful as corn, but 10 per cent. less fattening for hogs. At the same price per bushel, if the wheat is ground, it is worth 10 per cent. more than corn as a grain for hogs. The pork from wheat-fed hogs is considered better than that made from corn, as it has a larger proportion of lean. Ground fine and fed as slop, it is much better for growing hogs and pigs, or other young stock, than corn. It might be used to better advantage by mixing two parts corn, two parts oats, and one of flax seed, and grinding together, fine. A small quantity of wheat has been fed alone to work horses, but has not given the satisfaction obtained by the use of corn or oats. Wheat sells here for 50 cents and corn for 42 cents; at such prices, it is better to feed than sell the wheat. Public mills are too likely to lose some of our sacks and take full toll from all that remains. The small cast-iron mills do not grind fine enough for good feed. Wheat land here is worth \$35 per acre. Counting interest, wear and tear of equipment, and all expenses, it costs about \$1 per bushel to bin 10 bushels of wheat per acre; 15 bushels, 67 cents; 20 bushels, 53 cents; 25 bushels, 46 cents; 30 bushels, 43 cents, and 35 bushels, 40 cents per bushel. Straw is worth 25 cents per acre. Wheat is the best of all feed for fowls.

WASHINGTON COUNTY.

D. E. Ballard, Ballard's Falls.—Considerable wheat has been fed, soaked or ground. It is as healthful and nourishing as corn; and, to hogs, proves much more fattening than corn, especially when mixed with corn and coarsely ground—chopped. In that form, it is very satisfactory for hogs and cattle. Wheat sells here for 40 cents and corn for 25 cents per bushel, at which prices the wheat is worth more for feed than for shipping. Chopped wheat fed with corn, half and half, is far more profitable to the feeder than selling wheat and buying bran or shorts at current prices. I use an iron-bur mill attached to the same windmill which does my pumping, and the grinding costs about 5 cents per bushel; this is more than overbalanced by the increased value of the feed. Computing interest, labor, and wear and tear of equipment, it costs about 90 cents per bushel, in the bin, to raise 10 bushels of wheat per acre; 15 bushels, 67 cents; 20 bushels, 50 cents; this is as high as we ever get in the scale of wheat yield. Sixteen bushels per acre, at a cost of 60 cents per bushel in the bin, is about what we have averaged for the past 10 years. Straw is worth about \$1 per acre; I always consider that the straw just about evens up the cost, and wear and tear of the farm implements. Wheat is raised to rotate the crops, and that more corn may be raised. Wheat can be raised much cheaper on corn ground than elsewhere. In "finishing off" a bunch of cattle, I try to keep ear corn, shelled corn, oats and chopped feed (wheat and corn) in the feed boxes, from which they can help themselves to what they like, which is mostly the wheat-and-corn chop.

WILSON COUNTY.

S. S. Benedict, Benedict.—A fourth of the wheat fed whole passes undigested. For hogs six months old or over, it has about the same fattening value per pound as shelled corn, and a fair return per bushel is 15 pounds of live pork. At the same price per bushel, it is worth as much for old hogs as corn; for pigs, it is worth 50 per cent. more, and there is nothing better. It is fed to work animals, milch cows and other cattle with an equal quantity of either corn or oats, but is not especially better than either. At the present price, of 45 cents, and corn at 37 cents, the wheat can be more profitably used than sold, or exchanged for shorts or bran at current rates. The customary charge for grinding is five-eighths toll, or 5 cents per bushel, and the grinding makes it worth that much more, although the work can be done

with steam or horse power on the farm for 2 cents. The cost to raise, on land worth about \$20 per acre, is, for a 10-bushel crop, 60 cents per bushel; 15 bushels, 45 cents; 20 bushels, 37 cents; 25 bushels, 30 cents; 30 bushels, 25 cents. My experience has been, that for young animals of all kinds, during the early growing period, when bone and muscle are desired instead of fat, wheat is most excellent; but to finish them for market, corn is yet king.

THE SORGHUMS, FOR FORAGE AND GRAIN.

By F. C. BURTIS, State Agricultural College farm, Manhattan; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

The most extensive cultivation of the sorghums for fodder and grain, and their greatest value as such, is with the Western farmer in the drier districts, where the question confronts him as to what, taking one year with another, will yield a sure and profitable crop of fodder and grain. In endeavoring to find a plant that would fill the above requirements, the sorghums have been investigated and found to contain many valuable points as such, and the rapidly extending area planted to the sorghums every year goes to show that the farmers are realizing the value of this crop. It is true that this rapid increase has been in the last few years, and the question might be asked, Why have the people been so long to realize the value of sorghum for this purpose? I would answer by stating that it is only within the last few years that varieties of sorghums that produce large yields of grain and fodder have been introduced. The dry-weather-resisting qualities of sorghum were long ago demonstrated by its growth in the almost rainless districts of Asia and Africa.

Sorghum has an endless number of varieties, and a proper choice will be a long step toward success. Our experiment station has grown and tested over 200 so-called varieties. The seed of the greater number of these was furnished by the United States department of agriculture, collected in all parts of Africa and Asia. Most of these belong to the nonsaccharine group, and were grown with the object of fodder and grain. All but a few of these have been discarded as inferior sorts, and a list of a dozen will include all worthy of mention. It is the intention of this paper to give the points of difference of real importance to the farmer.

First, the varieties of sorghums are divided into two general groups, the saccharine and nonsaccharine. All varieties that contain sugar belong to the first-named group, and non-sugar bearing to the latter. Then I would mention that there are tall-growing and short-growing sorts; some with large, coarse stalks, and some with small, slender stalks. Some abound in foliage, and others have comparatively few leaves. With some, most of the leaves remain green until killed by frost, while with a few the leaves commence dying on the lower part of the stalk long before the grain is ripe. Some varieties will mature seed in the ordinary season of Kansas, but other large-growing varieties have been grown at our station that never reached near enough to maturity to head out.

In selecting, we would naturally pick for a large-growing variety, giving a large yield of feed per acre. The first objection to such a selection is, that such a variety hardly ever matures the seed and the yield of grain is not as large as the medium-growing kinds; the tall, heavy stalks are very difficult to handle, and farmers say they would rather grow the medium sorts and put up with a little less fodder than to have the last-named objection to deal with. Medium large stalks are desirable, as the slender ones lodge very easily and make the harvesting of the crop almost impossible. Some very large grain-producing sorts have been discarded at the station, because the stalks were too slender to stand up. The short-jointed stalks

should be selected, as they are stronger and carry many more leaves. The drying of the leaves on the lower part of the stalks is the objection to some of our nonsaccharine varieties. When the leaves die like this the rain bleaches them, and they are rendered worthless as feed, even if the wind has not already blown them away.

Again, there is a great variation in the form of the seed top. In one type it extends erect on the stalk, or may lean to one side a little, while in the other extreme it makes a short curve and hangs downward, and is termed goose necked. Some of these heads are very open and sprangling, others are long and slender, while in other types the heads are almost round or oval. The erect seed tops are the most desirable, as the goose necks tangle and make the crop very tedious to handle, unless the expensive practice of cutting off the heads while the stalks are standing is followed. Life is too short to bother with them while we have good varieties of the other type. The varieties that have the open and sprangling heads are small grain yielders, but a medium-compact seed top is the most desirable, as in some varieties they are so dense that the seed molds, and then stock do not eat it readily.

The seed of sorghum varies in color all the way from black to a snow white. In some cases the grain is quite soft, and in others it is hard and brittle; some thrash easily from the glumes, while others have to be fed with the glumes adhering; these contain a bitter and disagreeable taste. The black or dark-colored seed is said to contain bitter principles that the white does not, but the light brown or amber-colored grain is eaten as readily as the white. Birds, and especially English sparrows, are quite fond of sorghum seed as it is ripening, and seem to prefer the white, but any variety where the glumes do not cover the seed well is troubled by them. The soft grains might be preferable to the hard and brittle ones, but much stress should not be put on this point, as all the seed should be ground before being fed.

There is a difference of opinion as to which is the more valuable, the saccharine or the nonsaccharine sorghum, for a forage and grain crop. While we say that these are two different groups, they merge more or less into each other. There is a gradation from the extreme that the chemist picks out, where there is the highest per cent. of sugar, to a medium, where the stalks are quite juicy and may or may not contain a small per cent. of sugar, and then there is the other extreme where the stalks are filled with a dry pith. If the division line should be strictly drawn according to the name, some of our so-called nonsaccharine varieties would come under the other group, as some of them contain quite sweet juices. The best sugar varieties are small grain producers, when compared with our best nonsaccharine varieties. Where such a variety as Kansas orange will yield 20 to 30 bushels of grain per acre, red Kaffir corn will yield 40 to 50.

For stock feed there is no difference in the value of the grain of the two. As to the fodder of these two, the yield of the first named is generally from one-half to one-third the more. If fed properly, all the stalks of a saccharine variety will be eaten, and the same is about equally true of the fodder of the red Kaffir corn; but of many nonsaccharine varieties, the stalks are so dry and hard that stock will eat but little of them. Some of the large-growing, nonsaccharine varieties, as white Milo maize, will yield as much fodder as the sugar-bearing kinds, but the large yield of sugar that an acre of such a variety as Kansas orange would produce has considerable feeding value. On poor soil, the nonsaccharine varieties will do the best, especially in yield of grain. Opinions conflict as to which of these classes stands dry weather best. I think them about equal in this respect. The stalks of most of the sugar canes are so slender or weak that they lodge easily, and this is especially true when they are planted thick enough to give their largest yield of grain.

Of all varieties tested at the experiment station, the following list includes those that have given the largest yields of grain or fodder, with a minimum number of



KAFFIR CORN.



JERUSALEM CORN.

objectionable points named above: Early amber, Kansas orange or white African should be selected, if great value is put on the saccharine element. They are not the largest producers, but mature in an ordinary season, and the grain is suitable for stock. Early amber is the smallest yielder of the three, but is extra early, and tillers well. The white African produces white seed, but it is covered with black glumes; consequently the birds do not molest it.

In the nonsaccharine varieties, types differ widely. Jerusalem rice corn has rather short, somewhat slender stalks, with limited foliage, and the stalks contain a dry pith. The seed top is large, and hangs on a short goose neck. The seeds are white, very large, and more or less sweet, and considerably softer than in any of the other varieties. This variety ripens extra early, and generally gives a large yield of grain, but the English sparrow has always harvested over half of the crop for us. Of the fodder, all but the leaves is about worthless. This variety has been well known for a number of years. Egyptian rice corn does not differ materially from Jerusalem corn in growth or results. These grow in height from $3\frac{1}{2}$ to 5 feet.

White Milo maize is a tall, vigorous growing sort, with large, strong, juicy and sweet stalks, well covered with leaves. The heads are large and slender, grow erect, in compact panicles, and contain large white seeds. Kansas seasons are generally too short for this to mature seed, but in some seasons the yield of grain has been large. Where only a large yield of fodder is wanted, it answers the purpose well

and compares well with the saccharine varieties in yield. In the season of 1889, it produced 15 tons of dry fodder per acre and 57 bushels of grain.

Brown Durra, sometimes called yellow Milo maize, is a variety very similar to white Milo maize in growth of the stalks, but the seed top is short and thick and hangs on a goose neck, and the grain is a light yellow. On good soil and in a good season the yield of fodder is very large, but the seed matures even later than the above variety, so as a grain producer it is of little consequence.

White Kaffir corn is one of the early introduced varieties of the nonsaccharine sorts. The plant grows short and stalky, and has short joints covered with large and numerous leaves. At maturity, the stalks are quite dry and pithy. The seed tops grow erect, are long and slender, and bear white seed. If dry weather checks this variety, the seed tops do not push out of the sheath, and the lower parts molds and the grain is worthless. Under ordinary conditions, this variety yields from 40 to 50 bushels of grain per acre and a fair yield of fodder, but the stalks are mostly refused by stock.

Red Kaffir corn was introduced at our experiment station in 1889 from the United States department of agriculture. It differs from the white in the fodder, in that it grows taller and more slender and is much more juicy, and sweeter. The seed differs in color, and is some smaller and harder. At the station it outyields the white in grain and fodder, and matures some earlier, and we consider it superior in all respects. Of all varieties, red Kaffir corn is the most valuable for farmers in general. It combines a large yield of fodder with the largest yield of grain, and is of a growth suitable to economical harvesting. Stock eat the fodder with a relish, and the feeding value of the grain is excelled by none. It stands dry weather as well, and does better on poor soil than any other. But it will respond well to good soil and plenty of moisture. After a variety has been selected, an important point is to keep it pure, which will take some care if several kinds are raised in the same field. Sorghums cross fertilize quite readily, and promiscuous crossing deteriorates the variety. The crop responds quickly in improvement by selection of seed. Select large, well-formed seed tops, and a year or two will show an improvement.

The cultivation of sorghum is very much like that of corn, but the characteristics of the plant admit of some different methods, and in some respects require different treatment. Sorghum is a semitropical plant, and requires warm weather to develop it. The mistake is often made of planting too early. Before or not later than corn was the practice a few years ago. Generally, the result of this was a very poor stand, and what plants came up made a very slow growth, and the weeds and grass choked them out. The seed should never be planted until the ground is thoroughly warm, as at the best the seed is quite delicate to germinate. Kaffir corn has received the name of being more so than the common sorghums. I have seen it planted the middle of May, and followed by a heavy, cold rain, and less than 10 per cent. of the seed came up. Seed from the same bin, planted in the same way over three weeks later, gave an excellent stand and matured an excellent crop before frost. Shallow planting will help the germination much; half as deep as for corn is a good depth. The early growth is very slow and the plants tender; hence the necessity of having the ground free from weeds at time of planting.

A great advantage of the sorghums over corn for forage is that they admit of close planting. Corn cannot be sowed with good results. The growth of the foliage is too dense and makes the plants watery, and will contain little nutriment. Besides, it lodges very easily when planted this way, and dry weather will kill it very quickly. On the other hand, sorghums will admit of close drilling and produce a full grain crop, and, with thick seeding, will make excellent hay. As a hay crop, a yield of two to four tons per acre is not unusual. For this, the quantity of seed

sown per acre should be varied some, to suit the conditions, but, in most cases, if broadcasted, one bushel will be sufficient, and if drilled, three pecks. Put on enough seed to make the plants small and fine; the yield will be about as much, and can be handled much easier and better. The best plan is to plant thick enough to make good, fine hay, without any thought of the grain.

If grain is wanted, drill the rows far enough apart to admit of cultivation, so as to produce the largest yield of grain. At the experiment station, we find, to give the maximum yield of grain, the rows should be no further apart than three feet, and may be as close as $2\frac{1}{2}$, and the stalks should be from four to six inches apart in the row. The above applies more closely to such a variety as red Kaffir corn, as in rich soil some of the ranker-growing sorts will lodge when planted this close.

Cut and shock as corn. Special care must be taken, as the heavy seed tops have a great tendency to twist the shocks down. Make large shocks and tie well at the top. If they stand well, they may be left in the field until wanted for use, although the better way is to haul and stack in ricks. The stacking is much better for a saccharine variety, as it will not freeze and thaw and dry out so much. Some go to the trouble to cover sufficiently with straw in order that it will not freeze, but this is not necessary if it does not freeze and thaw and is kept dry. It will keep well and be relished by stock until spring rains and thaws come on.

The question of harvesting the grain of the sorghum crop has always been a problem. The general practice has been to feed the grain and fodder without separating. This is wasteful, as little good is realized from the seed without grinding, and the proportion of grain to fodder is too great for general feeding. As to Kaffir corn, the problem has been solved. After the fodder has cured well in shock it may be run through a thrashing machine and the grain separated, as well as is wheat. The grain does not crack as badly in thrashing this way as when the heads have been separated first. The fodder comes through in a more or less broken condition, and should be stacked in a rick and covered with something to shed rain. This operation is not well suited to the very juicy varieties, and I am doubtful of it being advisable, but have heard of an instance or two where it has been done. Where the thrasher cannot be used, the next best method that I know of is to load the stalks on a hay rack, with the heads extending over the edge, so that they can be cut off with a hay or corn knife. At first thought this may seem like considerable trouble, but the fodder may be put on as fast as you would load, for it is not necessary to get every head, and some may be cut off quite long. A binding pole will hold the fodder in place while the heads are being cut off. The seed can then be thrashed or flailed.

To harvest sorghum hay and keep it sweet and bright requires judgment and care. No fixed rules can be laid down for this, and it must be governed by the weather and other conditions. In our ordinary fall weather, if the crop is not too heavy, it will cure sufficiently in two or three days after cutting so that it can be cocked. If the leaves are dry, the juice in the stalk will keep. At first, at any rate, the cocks should not be large, and should be well raked down to shed rain. After standing in the cock a week or 10 days, it may be hauled and stacked. The stack should be covered with some material that will turn water.

In comparing sorghum with other crops, the one great claim is that it endures dry weather so much better. While it will not grow without moisture any more than other plants, its numerous and deep-set roots enable it to tide over a dry season disastrous to other crops, and when rain comes it will take a new start and produce a fair crop of fodder, if not grain and fodder. With corn, there may be sufficient water in the soil to make the crop, and even then hot winds for a few days can materially injure it, if not entirely kill the tassels and make a grain failure; sorghum

under the same conditions, will suffer but little. One great drawback to the making of a first-class quality of corn fodder this far west is, that most of the leaves are dried up and blown away before the crop can be cut without a large shrinkage in the grain. On the other hand, sorghum leaves are green and flourish after the seed is ripe. My comparisons are limited to corn mostly, as these two plants are similar in growth. Red Kaffir corn is suggested now as a substitute for corn. The table on the following page will show the comparative results of these two crops for the last six years on the college farm:

YEAR.	RED KAFFIR CORN.		CORN.	
	<i>Grain per acre. Bushels.</i>	<i>Stover per acre. Tons.</i>	<i>Grain per acre. Bushels.</i>	<i>Stover per acre. Tons.</i>
1889	71.00	9.00	56.00	2.50
1890	19.00	4.20	22.00	2.50
1891	98.00	6.00	74.00	2.75
1892	50.00	5.00	30.00	4.55
1893	49.00	5.25	30.00	1.75
1894	00.00	2.00	00.00	1.00
Averages,	*57.40	5.29	*42.40	2.50

*Average of five years.

In but one case does the corn yield more than the Kaffir corn, and that is in grain in 1890. This was due to an early frost, September 12, that killed the Kaffir corn just as most of the seed was in the milk, and it made nothing but chaff. The corn was also injured. The yield of stover in 1894 is small in both cases, and the grain a total failure. An appreciable rain did not fall between the middle of July and the 1st of September. The corn grew side by side on alternate plats. They had the disadvantage of being in poor soil underlaid with hardpan. Both were planted on May 15. The corn showed the effects of the dry weather first, and by the middle of August was entirely dead. The tasseling had only partly taken place. The Kaffir corn remained green, but the growth was checked. After the fall rains came on, the growth started up some and a few heads appeared, but were blighted. The table shows the yield of the Kaffir corn stover to be double that of the corn in this case; but all the difference in value is not shown there. Numerous investigations prove that the per cent. of digestible dry matter in corn fodder so immature is much less than when the crop is mature. The feeder recognizes this fact, and the general complaint this winter is, how much fodder the stock eat, and how little good it does them. The dry weather kills the corn, and then it must be cut, but the sorghum lives on; although the growth may be checked, the crop matures.

Two tons of Kaffir corn stover may seem like a small yield, but, for the same reason that caused the small yield, the tame grass crop was a total failure with us in most cases, and prairie hay did not yield over half a ton per acre, and it had the benefit of fall rains. The stover from corn and sorghum do not differ materially in composition or digestibility, but in the palatability there is a great difference. How easily a crop may be utilized for feed is an important point in its value. The following applies to corn stover in central Kansas: At our experiment station, cutting up corn stover with the common straight-cut machines does not induce the stock to eat the stalks much better than when the stalks are fed whole. When fed cut up and in mangers, there is a waste of from 30 to 40 per cent., which is refused. Fed whole on the ground, there is a waste of from 50 to 60 per cent. Sorghum, on the other hand, with no preparation, will all be eaten up, and the stalks are the desirable parts. As to the grain, the corn is the most desirable for utilization as feed,

being larger and usually softer, and may be fed with excellent results without grinding. Sorghum seed is hard and small, and must be ground or soaked for the best results. Corn and sorghum alike furnish food rich in digestible carbohydrates, fat-forming foods, and should be fed in connection with some food rich in nitrogen, as alfalfa, especially if fed to growing animals.

As to second-growth sorghum killing cattle: I do not take up this subject because I have any additional information to what Secretary Coburn has already published, but a paper on sorghum for forage would not be complete without mention of this point. The facts of the case are, that second-growth sorghum sometimes kills cattle and sometimes does not; and that in some cases a very small quantity, a handful or two, will kill them about as quick as strychnine. A few years ago these casualties were few and little heard of, but during the past summer many have been reported. In 1893, a case was given in the *Breeders' Gazette* of sudden killing of cattle by eating second-growth sorghum, and the editors asked for more experience in this line, and only two more cases were reported. Last year there was more second-growth sorghum than usual. The dry weather stopped the growth, and in many localities the crop was cut, and, when the rains came in September, there was a rank second growth. At first, when reports came out, it was said that the killing was probably due to hungry cattle unaccustomed to green feed being turned into second-growth sorghum and allowed to eat all they wanted. But cases are on record where a few handfuls have killed well-fed cattle. Regent Goodyear, of our agricultural college, relates a case near his home. A bull and some cows were being pastured near a patch of second-growth sorghum, and separated from it by a temporary fence, with a boy to guard that they did not go through. The bull went through the fence and had taken a few mouthfuls before the boy could get him out. The bull died in a half hour.

At first it was thought that the danger was only in common sorghums, but second-growth Kaffir corn has proved equally dangerous. What it is about sorghum that has this deadly effect is not known yet. In most cases where fatal results have occurred it has been from eating the green plant. But our Doctor Mayo has a case reported to him where the cured fodder had the same effect. Some of the fodder was procured, and the case is under investigation at the present time. In the face of all this, we hear of farmers who have raised sorghums for forage 10, 15 and 20 years, and often pastured the second growth and had no bad results; and many cut two or three crops of sorghum hay in a season from the same plants and consider it the best of feed. While my advice is, be very careful with second-growth sorghum, I would at the same time urge our farmers to plant more rather than less acres of sorghum and red Kaffir corn.

DISCUSSION.

MR. WHEELER: Have you ever raised Jerusalem corn on the college farm?

MR. BURTIS: Yes; side by side with other varieties.

MR. WHEELER: What is the difference between that and the red Kaffir corn?

MR. BURTIS: It is earlier; it has white seed; but the stalks are dry. The stalks of the other are juicy.

MR. COLLINS: When red Kaffir corn is cut and shocked, how long would you leave it in the shock before it will be ready to run through a thrashing machine?

MR. BURTIS: Until the last of December or the first of January. That has been our practice at the college. About two months.

MR. COLLINS: If the Kaffir corn is put in shocks, and stands to cure, will not birds destroy much of the seed?

MR. BURTIS: They will.

A DELEGATE: Will seed keep if it is put in a granary which is deep?

MR. BURTIS: It will.

A DELEGATE: Have you any experiments showing the cost of producing so much of the seed from the grain?

MR. BURTIS: We have not; but anyone who is accustomed to raise any farm crop could easily figure one out.

MR. COLLINS: Have you any other method than that mentioned for removing the heads from Kaffir corn?

MR. BURTIS: No.

MR. COLLINS: Will the heads heat and damage if put in large heaps?

MR. BURTIS: Not if thoroughly cured.

RAISING, HARVESTING AND MARKETING POTATOES.

By STATE SENATOR EDWIN TAYLOR, Edwardsville; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

Growing potatoes is a very common diversion. Nearly everybody with a garden has indulged in it to some extent. Potatoes are of more value to the world than any other vegetable. They are well named "the poor man's necessity and the rich man's luxury."

The most important factor in potato growing is the soil. A rich, sandy loam is best. Bottom land is commonly preferred, both because of its fertility and its friability. Where fertility is lacking in soil, it may ordinarily be supplied artificially. The two great sources of artificial fertility are the fertilizer factory and the "beef factory." Some potato growers report large profits from the use of commercial manures. I have used several of the leading brands of manufactured fertilizers (including the Mapes, Bradley, Coe, and Armour), in ton and half-ton lots, uniformly at a loss. The best result I ever obtained was from a half a ton of Armour's manufacture, this summer.

In this case, the product of approximately one acre of potatoes fertilized with one-half ton of Armour's potato manure was carefully weighed and compared with the product of an equal-sized plat not fertilized. The result of the comparison showed an increased yield from the fertilized acre of 130 pounds of potatoes. Assuming them to be worth 50 cents per bushel, the manure returned \$2.18 per ton against a first cost at the factory of about \$22 per ton, showing a loss of \$19.81 per ton, besides freight and labor of application. Neither the Bradley, Mapes nor Coe fertilizers did any good in my field. But whenever I have applied "beef factory" refuse, the good effects have been apparent without the test of measure or scales. The manure made from feeding 126 head of steers a trifle over 100 days and 90 head of heifers about 50 days was spread upon 30 acres of potato ground, day by day, as it came from the sheds, and plowed under in the spring. The increase in yield, as shown by careful comparison with unmanured ground lying alongside, was 60 bushels per acre. Figuring these potatoes, also, at 50 cents per bushel, the profit, not counting labor of application, was \$30 per acre, or \$900 on the field. I assume that enough virtue from the manure remained in the ground after the first crop was removed to pay for handling and spreading manure, and that the increase in the first crop was clear gain. I have read that barnyard manure makes potatoes scabby and rough. With me, the reverse has been observed, namely, that where so manured they were smoother and brighter than on unmanured portions of the same field.

My rotation has been, in the main, first year, potatoes; second year, potatoes;

third year potatoes; and then potatoes *ad libitum*. It is a rotation which the best of soils will ultimately repudiate. While continuing it I have tried in several ways to break its severity. Where the potatoes are dug early I sow either oats or turnips. Oats planted in August will make a dense growth of top before cold weather. My custom has been to plow them under in November. The result on the succeeding crop of potatoes is very satisfactory. Turnips are supposed by the chemist to draw on the same elemental fertility as potatoes, and should injure the succeeding crop. In this particular, as in many others, the chemist is corrected by the book-keeper. Instead of turnips impoverishing the soil for potatoes they greatly improve the succeeding crop. I do not know "why;" I do not much care. Should crimson clover do well with us, I shall expect great things of it, because the time for sowing it is after early potatoes are dug, and it will be ready to turn under in the following summer in time for planting late potatoes on the sod. Perhaps, in this way, we can feed the soil and work it at the same time.

In Colorado, they plant potatoes on alfalfa ground with excellent results. In some way, whether by plowing under clover or alfalfa, or by the use of barnyard manure, or by the use of manufactured fertilizer, we must raise the per-acre yield of potatoes in the state of Kansas. In the era of low prices, which is plainly upon us, that is the only way to get a profit out of the crop.

It is likely that many soils would not be benefited by fall plowing. I think there is no question but that our "bottom" lands, in Wyandotte county at least, are improved for potatoes by plowing in the fall. This does not take the place of spring plowing at all. To many it would seem like labor worse than wasted; but the fact that it is almost universal among us shows that there is something in it. In general terms, I think it safe to say that anything which makes the soil finer helps the potato crop. Fall plowing notably assists in this.

The second consideration in potato growing is water. Potatoes are thirsty, particularly during the development of the tubers. Thrice and four times happy is the potato man who, like his brother in the state of Washington, makes his crop in a district of assured humidity, or else in irrigated lands where, having plenty of water at command, he can count the constant sun as working for him instead of against him. In a variable climate like eastern Kansas, he must supplement such deficiencies of rainfall as may occur with fertility, careful cultivation, strong seed, by planting as early as possible or decidedly late, and, in some cases, by planting under straw.

The third essential in point of importance in potato growing is the seed. That should be crisp and unsprouted. If buried, potatoes must be covered lightly at first, and the covering added from time to time, but only enough to protect the tubers from frost. This is the most unsatisfactory and expensive way of storing potatoes. The next worse way is a cellar under a building. The most satisfactory and the cheapest way that I know of is to store in a dugout. In most of our Kansas soils, no walls but the dirt walls are needed. The roof will be of earth over poles and brush. In wet weather such a roof will leak, unless covered with boards, cornstalks, straw, or other covering. The best location will be a slope or bank facing south. By leaving an alley through the center of a dugout, with plenty of large ventilator shafts through the roof, a brisk circulation will be set up whenever the door in the end is opened—particularly where the door opens on the level, as it will if the building is dug in the side of a bank. The trouble with a cellar under a building is to give it air enough and keep it cool enough.

The dugout should be built with a bin on each side of a central alley. The bottom of the bins should be raised six inches from the ground. Both the bottom and sides are best made of fence boards, with inch spaces between. The sides of the

bins should be clear of contact with the walls, whether stone or dirt. Spouts should be placed at intervals through the roof near the outside of the bins, through which to pour down the potatoes into the cellar.

Such a building, carefully managed as to ventilation, opened up on frosty nights and kept closed during the warm days of fall and early winter, will take Early Ohio potatoes through to spring without a sprout. Early Rose, Beauty of Hebron, and such varieties may require turning over once. The only antidote for sprouting, aside from the manner of storage, that I know of, is the scoop shovel. Potatoes may be kept in cold storage till August without a sprout. If taken out and planted then they will yield a crop which makes superior seed. I have not been able to detect any difference between it and second-crop seed, by which is commonly meant potatoes grown as a fall crop from seed raised that season.

The question of second-crop seed and northern seed is very important. In the South, the second crop is raised without much difficulty. With us it is hard to get the sets to sprout. I think there is no doubt about the superiority for seed of potatoes that are in full vigor of growing when killed by frost. Whether grown as a second crop in the South or a first crop in northern Dakota or from cold-storage seed planted in Kansas, I suspect does not matter much. What seems to be the important factor is, that growth shall have been arrested by frost when the potatoes are in greatest vigor, leaving the tubers full of stored energy with which to begin again, instead of having already started on the road to decay. Second-crop seed sends up a larger stalk than first crop; it makes fewer sprouts; it is a few days longer in coming up in spring; it gives a heavier growth of vines; contrary to what is often printed, the date of ripening is delayed. Instead of second-crop seed coming in earlier than first crop, it comes in later (in my experience, fully 10 days), and the yield is often doubled. I never knew of its being less.

Better results will ordinarily be secured from cutting seed potatoes as they are used than from cutting them in advance. Where cut in advance, they may be spread out thinly and the cuts will dry up, or they may be dried up by plaster (gypsum), or they may be thoroughly mixed with dirt. The cutting I prefer to have done by hand. An active boy or girl, after two or three days' practice, will cut 20 bushels per day. It takes a smart man to cut 40 bushels of potatoes per day with a machine. I prefer to have large potatoes cut to single eyes. I have thoroughly tried Mr. Greiner's plan of planting whole potatoes, both large and small, and am decidedly of the opinion that, although it has a distinguished advocate, under our conditions it will not do.

Where potatoes are planted 13 inches apart in the drills, with rows 32 inches apart, about eight bushels of seed potatoes, if cut to single eyes, will be required to the acre. From 32 to 36 inches is the best distance apart for potato rows, in my estimation; and after much experimenting upon the distance between plants, ranging from four inches to two feet, I have settled upon eight pickers for the Aspinwall planter, which puts the sets 13 inches apart in the row.

In planting potatoes, one of the most important details is depth. From three to four inches is our usual depth. The "trench system," so called, has never given as good results, with me, as shallow planting. The *Rural New Yorker* lays less stress upon it than formerly. Its inventor, Mr. Alfred Ross, deceased, of Penn Yan, N. Y., claimed for it great things. He obtained some remarkable yields—in more than one instance over 1,000 bushels to the acre—and he considered that his method of planting was one of the great features in his success. His plan was to mark out eight inches deep, fill up the furrow two inches with mellow soil, drop the seed upon this bed, cover lightly, and, as the plant grew, to fill the trench up gradually. I have never been able to approach his yield of 1,000 bushels to the acre; a trifle

over 400 is my limit, and about 150 my average. I would rather pay for having potatoes planted with an Aspinwall planter than to have them planted by hand free of cost.

The cultivation, in my practice, begins a few days before the potatoes come through the ground, by running over the surface both ways with a light harrow or weeding machine. If, on account of hardness or otherwise, the crust is not entirely broken up and fined, I should go over it the third time; then rest until the plants are two inches high, when the field should be again gone over with weeding machine across the rows and also lengthwise or diagonally with them; then start the cultivator, throwing the soil close against the plants. If the man is careful, and the planter has been driven straight, this work can be done perfectly by going once to the row with a Planet jr. This tool is provided with a spreader, with which the operator can change its width without stopping, to accommodate it to uneven planting, and do with it, and one horse, fully as good work as any wheel cultivator does with two horses. This first cultivation should be immediately crossed with the weeding machines. By this time the plants will be four to six inches high, and the ground perfectly clean. Cultivation with Planet jr. should follow at least once a week until such time as the vines cover the ground. The Breed's weeder is the best-known weeding machine. I prefer the Hallock. Both are cheap (Hallock's, \$9; Breed's, \$12, I believe), and as they take two rows at once, and use only one horse, it is economy to have enough of them to do the work they are intended to do just when it is needed to be done.

The next step is digging. There are many geared machines for this purpose. I have had most of them on trial. They are all failures. One of them, the Hoover, I was so well pleased with that I bought it. It has since been discarded. In some soils I have no doubt that it works well. Our Kansas soil, to use a word borrowed from the potato-digger men, won't "flow." With us, any machine using an endless apron of slats for elevating and separating the potatoes and dirt will carry the bulk of the dirt, except, perhaps, in very dry weather, clear through into the shaker. This disposition of the soil adds greatly to the draft of such machines and adds to the liability of breakage. In the gravelly soils of Colorado, I am told that the same machine raises no dirt more than half way up the incline. In my neighborhood, we have all gone back to the pronged plow for a potato digger, although there were 17 Hoovers sold there in one season. Those makes of potato plow are most in request that open the potato ridge both ways with a sharp, square turn. They all use rods for the moldboard. In weedy ground, a plow with a high beam, like the Hallock, has the advantage. Where used in connection with a weed divider, such as that sold by the Rock Island Plow Company, very fair work can be done even in weedy ground. Ordinarily, if the grass and weeds are heavy, it will pay to mow and burn them.

The two most important factors in cheap potato digging are shallow planting and a big yield. If planted shallow, the plow will run through the ridge without covering the tubers up; but if planted deep, so much dirt must be moved that some of the potatoes will be buried. When the yield is 200 bushels to the acre, a good man will pick up and put in sacks 75 bushels a day; where it is 400 bushels, he will pick up and sack 100 bushels per day. The best way, where the digging goes forward regularly, is to station the pickers at equal distances along the row, allowing each one to pick up on his own station, back and forth, and no more. The plow should take every other row. The one-half bushel wire baskets made by the Kansas City wire works are the best baskets for picking up in that I know of. The pickers will put one bushel in each sack if the potatoes are to be further sorted, or, if sorted on the ground, the sacks will be filled ready to sew.

Ordinarily, I practice sorting as a separate handling. A better job can be done in that way; the potatoes will be clean, and the small potatoes can be saved for the stock. When prices are low, well-sorted potatoes are the only kind it is worth while to pay freight on. Small potatoes have a value as hog feed, and are readily eaten by cattle and horses. The plan of picking up and handling in bushel crates, while a great improvement upon handling in bulk, is entirely superseded with us by substituting sacks for crates, and by using something with a handle for picking into.

The last item in harvesting is the question of packages. Through the hot weather of summer, potatoes are liable to rot if shipped in bulk. At that season, if shipped in box cars, the doors must be left open for air. Frequently, they are put in stock cars that have the cracks battened, for more perfect ventilation. In either case, the potatoes must be handled quickly, or they become unsalable through turning green. Potatoes keep and handle much better in hot weather in barrels or sacks. Where barrels and sacks are well bought, the cost of sacks per bushel is about 3 cents; of barrels, about 8 cents. The labor of putting into barrels is somewhat greater than into sacks, but some of the largest operators think barrels are yet the most economical. For instance, Mr. Sam. Clawson, of Ashwood, Tenn., whose shipments frequently reach 20,000 barrels in a season, uses nothing else.

This introduces us to the department of marketing potatoes. In that particular game which Ah Sin "could not understand," I am told that the basic principle is to "take a trick" whenever that maneuver can be executed. The same idea has a place in selling potatoes. I like to begin among the first and sell enough to balance accounts with the crop. The remainder I feel at liberty to hold or sell, as circumstances seem to indicate. There is a tendency among farmers to hold on for high prices that frequently leads them into disappointment.

Ordinarily, the Kaw Valley Potato Association, which places my potatoes, has consigned its stock in the early summer, while the market was uncertain, or else had it sold through a broker. Sometimes at that season it has its own agent on the ground in the principal market which it is shipping to. Later in the season, when potatoes "stand up" all right, and the price has about found its level, we solicit orders from responsible parties. In the spring, when prices are liable to fluctuate, we prefer to sell to operators who see the stock and whom we know to be responsible. Our motto is, to take a less price where we are sure of getting our money than to run any risks in pursuing a fancy figure. With respect to commission men, I may say they present more phases and variations of rascality than are easy to enumerate, but there are plenty of honorable men among them. There is no law against a farmer finding out the character and standing of a firm before he sends it a consignment. If we farmers would only use prudence and discretion in our shipments, the dishonest commission people would soon die out for want of prey.

I was once enthusiastic in advocacy of coöperative selling by farmers. The difficulties in its way are too numerous to recite in detail. They are in the main inherent in human nature. To such combinations as have so often failed these limitations of humanity are defects. As forming the basis upon which individual independence rests, they have great merit. If all the potato men *could* get together and ship and sell their product as one man, the economy would be immense. But the temptation for the head of the concern to go "wrong" would be too great for average human nature to stand, and the subjection of the many to the central authority would result in a manifest loss of individuality that financial gains could not reimburse. Such discipline and subjection as a successful crusade of this sort contemplates cannot be secured as men are now constituted in times of peace. I have known of several volunteer associations for selling potatoes. They have never lasted more than one season. The Kaw Valley Potato Association has a different basis. It is a corpo-

ration. Its membership is limited. The parties constituting it would be called large growers. They pool their issues without friction and with decided advantage. The expense of such an organization is, however, considerable. It must do a large business or the gun will kick harder than it will shoot.

In closing, I would like to add a word upon several related topics; one is the subject of new varieties. The Early Rose made a fortune for the introducer. Since then fortune hunting along that route has been brisk. At rare intervals a new potato is brought forward having merit. Ordinarily, the extent of the advertising of a new variety is in inverse ratio to its value. The Early Ohio is easily the dominant potato in this state. It was put forward when introduced in very modest terms. Most of the new varieties are frauds. Never try a new variety in a large way. There are many questions about potatoes that one would like answered. One is relative to small potatoes for seed. My first introduction to the Rural Blush was in the shape of two little tubers, sent me by the *Rural New Yorker*, in a penny match box, which was a world too large for them. From those two culls I got 13 sets. The crop resulting was very fine, many of the potatoes weighing over a pound, the whole turn-out running very large. Those large tubers were in turn planted, and the best, also, of their raising successively for several years, but I never equaled the product of the culls. Now, suppose the small potatoes had been continuously thereafter planted instead of the large ones, what would have been the result? Does anybody know that they would n't have done as well?

In sweet potato growing, the small tubers are sprouted year after year. What reliable information is there that the same method might not result with equal advantage if practiced on that other "fruit that grows at the root," the *tuberosum Irish-manum*?

My early practice in planting potatoes, before the advent of the Aspinwall planter, was to have the dropper step on each piece. It was a pernicious custom, adopted on the strength of the argument made for it by agricultural writers, in the callow days before I had learned to distrust conclusions in agriculture based upon *a priori* reasoning. Stepping on the sets thrusts them into the ground too deep, as I discovered by observing that around the stumps, where the potatoes were shallow, the yield was better.

When I was a boy, up in Michigan, we used to put plaster (gypsum) upon the potatoes, with great improvement to the crop. I have several times tried Kansas plaster on Kansas potatoes, with no appreciable result. Is Kansas plaster different from Michigan plaster, or is the natural law in the potato world various, according to locality?

I have a neighbor who uniformly beats me in his potato yield. Our farms join; we have used the same seed; our lines of procedure have seemed to be identical until we came to the last cultivation; then he puts his cultivator down deep, especially next the rows, while I cultivate shallow. Since his root pruning has not prevented him from beating me with my surface culture, I am led to inquire whether there is not more made of surface cultivation than the facts in the case warrant.

The value of clover as a soil enricher has long been known. It is only in comparatively recent times that it has been called a "nitrogen trap," and in the most recent times only has the clover's ability to extract nitrogen from the air been ascribed to colonies of bacteria located in nodules upon its roots. Now, if clover gets its "pull" on nitrogen from colonies of bacteria, why might not the potato itself become a "nitrogen trap," if only the right kind of bacteria could be made to roost in its roots? For myself, I am not wise in such things; but, really, it does not seem at all a discouraging stretch of fancy that a man who could invent a

deadly fungus for the chinch bug could, by a flourish of the same magic wand, call up a nitrogen absorbing parasite for potatoes.

I should be slow to give advice, but perhaps I may be pardoned for saying to any enthusiastic young man who may now be contemplating a career in potato culture, that as carried on by many growers that calling partakes of the nature of gambling. The largest operator in the state, after a run of luck quite remarkable, has at last gone completely to wreck. I do entirely believe in the single-idea kind of farming within workable limits, but I don't believe in putting everything to hazard on one cast of the die. At the same time I hope the young man aforesaid does not contemplate as a permanent feature of his routine such a small percentage of potatoes as will make him miserable and yet do him no good. The greatest pullback of the average farmer is the fact that he is so frightfully "mixed." In his struggle with a confusion of littles he is like a man fighting bees—to conquer one brings no relief. The market gardener must have a large assortment of vegetables and fruits, among which may well be potatoes, but the farmer who essays to plant them at all should aim at doing enough to justify him.

It looks now as though, for a year or two more, potatoes might be the worst crop on the farm, instead of the best. If irrigation by the new methods proves to be half as successful as its advocates claim, its leverage upon potatoes will be greater than upon any other crop. It will result in moving the potato center for the West from Greeley, Colo., to Topeka, Kas. There never was a better time than now for the apprentice to tentatively take hold of this branch of farming, nor a worse one for the adventurer to go into it recklessly.

There are but three rules necessary for the novice to observe in this art to insure him success. They are, first, to do his farming in the best manner by putting good seed into good ground, and to follow that with good cultivation; second, to do his selling intelligently, and handle himself in the market as well as in the field; third, having undertaken this departure, to stay with it. If profits for one year or two years should be small, he must not permit that to discourage him; neither, if they rule high for a year or two, must he allow that to tempt him into extensions for which he is not prepared.

THE WELLHOUSE APPLE ORCHARD—LARGEST IN THE WORLD.

By PHIL S. CREAGER, Topeka.

"Kansas is no fruit country," was the old cry of people, both in and out of the state. It was started before there had been tests to prove or disprove it, and has been kept up to a greater or less extent since orchards and vineyards and small-fruit plantations have, by their bountiful crops, given it the lie direct. It is echoed even yet by the few uninformed individuals who are not aware of the fact that Kansas ships strawberries to Nebraska, Missouri, and Colorado; grapes to New Mexico and Arizona; peaches (sometimes) to the distilleries of St. Louis, St. Joseph, and Lincoln; pears to the most critical and exacting of Eastern markets; and apples by the car load to "Ould England" and other European countries.

"Kansas is no fruit country!" Perhaps not; but she has many men who have made fair fortunes raising fruit on her fertile prairies. She has orchardists by the hundred who realize more net cash from their plantations each year than the land on which they are planted would be worth with the trees removed. She has orchards whose product, by going into competition with the fruit from those regions, has made the commercial orchards in the famous apple-growing states of Michigan,

New York, Illinois and Wisconsin practically valueless except for firewood, while the Kansas orchards still yielded their owners most remunerative returns. She has an 800-acre orchard in Reno county, a 500-acre orchard in Greenwood county, scores of 100-acre orchards in Doniphan, Atchison, Brown, Leavenworth, Douglas, Johnson, Miami, Wyandotte, Wilson and other eastern counties; and, most important of all, the largest apple-orchard plantation, under one management, in the world.

The last-mentioned plantation is owned by Fred. Wellhouse & Son, of Fairmount, and is located partly in Leavenworth and partly in Osage counties. Mr. Wellhouse was one of the first men to attempt commercial orcharding on a large scale in Kansas, and he has made so flattering a success of it that he is known throughout America as the "Apple King of Kansas." His orchards now comprise about 1,500 acres, of which 440 acres in Leavenworth county are in full bearing, 800 acres in Osage are just beginning to bear, and the remainder, divided between the two counties mentioned, have yet to yield their first fruit.

The original plantation was an orchard of 120 acres, established near Fairmount, Leavenworth county, in 1876. Two years later, this looked so promising that another 160 acres was planted, making an acreage that was again increased in 1879 by the planting of another quarter section. The first fruit, 1,594 bushels, was gathered in 1880, four years after the first planting. In 1889, 1890, and 1891, the plantations were more than doubled in extent by the setting to trees of an 800-acre tract near Wakarusa, Osage county. Since that, smaller additions have been made to the orchards, until now the total area in trees is 1,500 acres.

YIELDS AND PROFITS.

During the 14 years since the orchards came into bearing, there have been but two failures—in the seasons of 1892 and 1893—and the unfruitfulness of the trees for these two years is not chargeable to the unfavorableness of Kansas soil or climate, for the failure was general throughout the country, even in the most favored fruit-growing regions.

The following is an accurate statement of the quantity of marketable fruit that has been gathered each year:

1880.....	1,594 bus.	1888.....	20,044 bus.
1881.....	3,887 "	1889.....	11,952 "
1882.....	12,037 "	1890.....	79,170 "
1883.....	12,388 "	1891.....	63,698 "
1884.....	11,726 "	1892.....	Failure.
1885.....	15,373 "	1893.....	"
1886.....	34,909 "	1894.....	47,374 bus.
1887.....	33,790 "		

The largest profit realized during any one year, as Mr. Wellhouse informs me, was from the 1890 crop of 80,000 bushels. The actual expenses that year were a trifle more than \$13,000, and the gross receipts from the sale of apples were \$52,000. The 1891 crop of 63,698 bushels sold for \$16,493, and the cost of gathering and marketing was \$8,853, leaving a net profit of \$7,640. The 1894 crop is not all sold at this writing (February 4, 1895), but its value, calculating from actual receipts and present market value, was \$18,716. As the cost of gathering and marketing was \$6,400, there is left a net profit of \$12,316.

The total yield up to date has been 351,235 bushels.

The gross sales have amounted to \$160,327.

The cost of gathering and marketing has amounted to \$59,991.

The net return has been \$100,336.

This percentage of profit will unquestionably be vastly increased as the plantations which so far have been solely a source of expense come into full bearing.

So far, the apples, culls and all, have cost about 25 cents per bushel, and as the

average selling price has been 53 cents, the net profit has been the handsome one of 28 cents per bushel.

WHERE THE CROPS HAVE GONE.

The fruit from the Wellhouse orchards has been disposed of as follows:

The 1880 crop went to a Leavenworth firm, for \$1.50 per barrel.

The 1881 crop went to a Denver firm, for \$4 per barrel.

The 1882 crop went to a Denver firm, for \$2.48 per barrel.

The 1883 crop went to a Denver firm, for \$3 per barrel, and the culls to Kansas City, for 30 cents per bushel.

The 1884 crop went to a Denver firm, for \$2.04 per barrel, and the culls to Kansas City, for 15 cents per bushel.

The 1885 crop went to a Denver firm, for \$2 per barrel, and the culls to Kansas City, for 20 cents per bushel.

The 1886 crop went to Denver, for \$1.45 per barrel, and the culls to Kansas City, for 13 cents per bushel.

The 1887 crop was sold in Kansas City, Leavenworth, and other points, for \$2.11 per barrel, and the culls went to Kansas City, at 27 cents per bushel.

The 1888 crop was sold in Denver, Leavenworth, and other points, at \$1.81 per barrel, and the culls went to Kansas City, at 14 cents per bushel.

The 1889 crop was sold in Kansas City and Leavenworth, at \$2.49 per barrel, and the culls went to Kansas City, at 18 cents per bushel.

The 1890 crop was shipped to Chicago, Lookport, N. Y., Philadelphia, and Cincinnati, and sold for \$3 per barrel; the culls were sold to a New York man, at 20 cents a bushel.

The 1891 crop was sold to a Baltimore firm and in Leavenworth, for \$1.75 per barrel, the culls going to a New York man, for 15 cents per bushel.

The 1894 crop, sold to a Leavenworth firm—all but 2,200 barrels, which are yet in cold storage—for an average price of about \$2.50 per barrel. The culls were sold to an Arkansas firm for 20 cents per bushel, and were evaporated at the orchards with the Wellhouse plant.

The disposition of the crops as given by no means indicates the places of their final consumption. The firms which purchased from Judge Wellhouse frequently reshipped to a great many different regions. Ryan & Richardson, the Leavenworth firm which bought the 1894 crop, shipped quantities direct to England. A great many apples have found their final market in the North, in Minnesota and the two Dakotas. The culls, wherever they may have been sold, have nearly always gone to evaporators.

VARIETIES.

The variety which Mr. Wellhouse has planted most extensively is the Ben Davis. This does not indicate that he considers it the best apple, but that his experience has been that its cultivation yields the greatest profit. The thrift, hardiness and early-bearing habit of the trees making it possible to quickly establish a paying orchard; the tendency towards heavy and reliable yield making the aggregate crop during the life of a plantation large; and the size, color, freedom from blemish, and outward attractiveness of the fruit, making it ready of sale, combine to make the Ben Davis, in Mr. Wellhouse's estimation, easily first in the list of commercial varieties.

But there is another variety, the Gano, which seems to be making its way into the place heretofore occupied by the Ben Davis, which it strikingly resembles, and of which variety many authorities claim it is but an improved strain. The Gano is as large as the Ben Davis, of even finer color, and the trees are as thrifty and as re-

liable in yield. Of the 270 acres which were added to the Wellhouse orchards last spring, 100 were of Gano.

Leaving out the Gano, which has not yet been tested in large quantity, not for a long time, Judge Wellhouse's second choice for a commercial variety is the Missouri Pippin, which in yield has so far been a trifle ahead of the Ben Davis. The Missouri Pippin bears very early and yields somewhat of profit before the Ben Davis has begun to yield any fruit, but its prime, decline and decay come early as well, and in later years it loses the advance over other varieties.

The proportion in which Mr. Wellhouse has planted other varieties very nearly indicates his preference for them in a commercial way. His orchards contain, of

Ben Davis	630 acres.
Missouri Pippin	320 "
Jonathan	260 "
Gano	100 "
York Imperial	95 "
Winesap	60 "
Malden's Blush	16 "
Cooper's Early White	16 "

Cooper's Early White is the only variety that has not paid. Neither it nor Winesap are being planted any more.

York imperial, though not thoroughly tested as yet, is looked upon with special favor as a commercial variety. The tree is thrifty, hardy, and very productive, although difficult to raise in the nursery. The fruit is of good and uniform size, well colored, a good keeper, and preserves its quality as to crispness and flavor as long as it lasts, never becoming spongy or flat.

METHOD OF PLANTING.

Mr. Wellhouse sets his trees so that the north and south rows are 32 feet apart, with the trees 16 feet apart in the rows. There are three main reasons for adopting this plan: (1) With the trees so close together they form their own wind-break, making hedges or belts of timber unnecessary. (2) The dense shade makes the evaporation of moisture from the soil less rapid, and the danger from sun scald of the trunks and branches less imminent. (3) It is easier to secure a good permanent stand by the close planting, and the excess of trees, if there is any, can be removed as is desirable.

Trees are always set in trenches, rather than in holes, for several reasons. It is a more rapid and less expensive method, and it insures better drainage to the trees. Besides this, it loosens the soil to a greater distance around the trees than is the case where the holes are dug, as ordinarily. Mr. Wellhouse's plan is to strike out a "land," about four ordinary furrows wide, where each row of trees is to be. From this "land" he turns two furrows each way, leaving a "dead" furrow. In the bottom of this "dead" furrow an ordinary listing plow is run, to a depth of 14 inches from the surface, if possible. Very little digging is required in this trench to prepare for the setting of each tree.

Trees are never bought of nurseries, but are raised. The advantages of this course are that the proprietor always knows just what is being planted; the trees are always on hand when wanted, and in the best possible condition, and they can be grown for a small part of the amount they would cost if purchased from a nursery. Mr. Wellhouse says that trees of the common varieties can be raised to two years old from the graft for less than 2 cents each.

Grafts are always made on "piece" roots, "whole" root grafts never having given satisfaction. It is the endeavor to get a tree on its own roots as soon as possible, and this is accomplished only by using "piece" roots.

CARING FOR THE TREES.

Trees are always headed very low and the heads kept as dense as possible to protect the trunks and branches from sun scald. Mr. Wellhouse says that he invariably refuses employment to men who will confess to any knowledge of horticulture, for such persons always persist in disobeying orders in regard to pruning. They insist on trimming the body of the tree up high and thinning out the head, which is not desired under any circumstances. Men who know nothing about pruning do as they are told. Sparing the pruning knife also promotes early bearing, in hastening the maturity of the trees. Missouri Pippin and Ben Davis have always been made to bear the fourth year after setting through allowing them to grow practically at will.

There are two other strong reasons for heading the trees low: The heavy prairie winds have less opportunity to whip them about and injure them, and the fruit is much more readily gathered where it is borne near the ground.

Young trees are never wrapped to protect them from damage by rabbits, dependence being placed upon the use of traps. Two or three box traps per acre, built upon a plan invented by Walter Wellhouse, who is associated with his father, and costing 15 to 20 cents each, insure immunity at a tithe of the expense attached to wrapping. The traps are about 22 inches long, six inches wide, and six high. They are built of inch lumber, that which has been weather beaten being much preferred as it is less likely to arouse a rabbit's alarm. One end is nailed shut, and the other is fitted with a wire door, hinged at the top and so arranged that it will be "tripped" at the slightest touch of a spindle inside. No bait is needed, as a rabbit will go into a dark hole anywhere. The rabbit when going in brushes against the delicately adjusted spindle, the door falls, and his days of girdling apple trees are over.

Young plantations are kept cultivated in corn until they begin to bear. They are then seeded to clover and none of the growth removed from the land. After the clover goes to seed each year the ground is run over with a cutter devised for the purpose, which cuts all the clover and weeds and leaves them for mulching. The action of the cutter is also to cover much seed, which insures a new growth of clover. The cutter is built on a plan very similar to that of an ordinary stalk cutter.

GATHERING AND PACKING.

The gathering of the apples is done by men in gangs of 12 to 15, each gang in charge of a foreman. An ordinary two-bushel grain sack, swung over the shoulder and kept open by a hoop in the mouth, is used by each man. He fills his sack as full as it can be conveniently carried, and empties into boxes on a wagon which is kept conveniently near. As soon as a wagon is loaded it is driven to the packing house and another takes its place. Two or three wagons are required to haul away the fruit gathered by each gang of men; 30 to 40 bushels per day is about the average made by the pickers. Fully five-sixths of the apples are within easy reach of the ground.

The foreman's duty is to see that the wagons keep pace with the pickers, so that there is no unnecessary carrying; to see that the men do not become too widely scattered, nor yet too much "huddled" to work to advantage; to see that the apples are picked "clean" and handled without bruising, and to keep the time of the men.

As soon as the apples are taken to the packing houses, of which there is one for each block of trees, they are sorted into three, and sometimes four, grades. Those of the first grade, or "shippers," as they are called, are placed directly into barrels and packed in the usual way, by "facing" the bottom, filling, and forcing the head

in with a screw press. The division between first- and second-grade apples is made only in size, both grades including only sound fruit. The third-grade apples are the small ones and those which, while not sound, are still usable. The fourth-grade apples are left in the field or fed to hogs. It takes almost as many men to sort and pack the fruit as it does to pick it.

SPRAYING.

One of the most potent factors in making the Wellhouse orchards profitable is the scientific and carefully conducted system of spraying for insect and fungus pests. By the proper use of London purple, at an aggregate cost for the season of less than 25 cents per acre, the ravages of the codling-moth worm, the leaf roller and the tent caterpillar are reduced to an almost inappreciable minimum, and the canker worm is made practically harmless. Apple scab is also controlled, to some extent, by the use of a solution of copper carbonate before the blossoms open in spring. The trees in these orchards are sprayed three times: Once before the blossoms open, with a solution of six or eight ounces of copper carbonate to 150 gallons of water; once as soon as the blossom leaves fall, with a similar solution, to which has been added a pound of London purple; and a third time, 10 days later, with a solution of a pound of London purple to 150 gallons of water.

To apply the spray, Mr. Wellhouse employs a machine of his own invention. It consists of a tank, mounted on wheels, and equipped with a pump. The pump is driven with a sprocket wheel, which gets its motion from the movement of the bearing wheels. A nozzle at one side of the machine directs a volume of finely divided spray onto a row of trees as the machine is drawn along. As there is no means of stopping the spray while passing the intervals between the trees, of course there is some waste, but the cost of the spraying solution is so trifling that this is scarcely worth considering. Almost any of the smaller spraying machines does as satisfactory work, but where there is so vast a number of trees to be treated, such a machine as is in use in the Wellhouse orchards is indispensable.

The 19 years' experience that Mr. Wellhouse has had in commercial orcharding in Kansas has served to confirm him in the opinion that Kansas can grow apples as certainly, as easily and as profitably as they can be grown in any state. He has often asserted, and repeated to the writer within two days, that "When we learn what varieties are best adapted to our soil and climate, and learn how to take care of our trees, Kansas will be the apple orchard of this country. We shall grow more apples than any other state in the union."

When he set his first plantation, and during the first years of his experience, it was much of a question in his mind whether the land would stand heavy cropping of apples without a manifest deterioration in the size and quality of the yield. The past few years have set his mind entirely at rest in regard to that point. He says that the crops borne by the trees set in 1876, 19 years ago, are as large and of as fine a quality of fruit as when they first began to bear. The finest Ben Davis apples he ever raised were borne this year on trees that had already yielded 12 crops since 1880. Neither do the trees show any signs of decrepitude or decay, and there is nothing as yet to indicate that they may not go on bearing profitable crops indefinitely.

THE BEST FIVE GRAPES FOR KANSAS.

By PROF. S. C. MASON, State Agricultural College, Manhattan; before the Kansas State Board of Agriculture, at its twenty-fourth annual meeting, January 9-11, 1895.

Why this delicious and wholesome fruit is not grown on every farm where corn is grown is a problem that all my acquaintance with Kansas farms and farmers has not yet enabled me to solve. Were I to make the statement that grapes are as easily raised as corn, it would doubtless be received with doubt, if not with actual derision, by the average Western farmer.

Grapes may be grown upon almost any soil but a wet and badly drained one. They will even produce a fair crop upon a soil too stony and poor to raise the proverbial "white beans." Vines should not be planted too near old orchard or shade trees, which are liable to sap too much of the moisture and by their shade prevent the proper ripening of the fruit, if you have a better place. If not, by all means plant them there. They will do the best they can, and afford you many a basket of fruit you might feel too poor to buy. If you can spare a piece of good ground, good enough for a garden, near the house and in sight of the living-room windows, let this be devoted to the vineyard. I speak of having it near the house, for a great part of the comfort of having your own grapes is derived from the privilege of walking out among your vines and picking an early bunch here and there as your fancy and appetite may prompt. Again, as to having the vineyard in sight of the house: a properly constituted horticulturist will derive much pleasure from sharing his choice fruit with his neighbors, more especially his neighbors' children. If the vineyard is too far away and out of sight, he may be deprived of this privilege, and, stepping out with a basket on his arm and the benevolent purpose in his heart to gather a basket of grapes for neighbor Jones's tea table, find that there are grapes for neither the neighbor's table nor for his own.

Once having decided to plant a few vines, the worst battle is over. The only thoroughly hopeless ones in horticultural work are those who never plant. The time to plant is in the spring, as soon as the ground is nicely warmed up. The time to decide what you will plant is now, right away, before you get out of the notion.

Now, this does not mean that you are to give an order to the first tree peddler who comes along, at \$1 a vine, or \$8 if you take a dozen; though I candidly believe that you had better pay this price than not to plant. For the standard and well-tried sorts which I propose to recommend, there are plenty of reliable growers who will sell you first-class one-year-old vines at from \$2 to \$5 per 100, and strong, fine two-year-old vines at from \$3 to \$6 per 100. The two-year vines are what I recommend, as they will start off more strongly and come into bearing enough sooner to more than make up for the difference in outlay. While a dozen vines is a good start, and the planting of that many should be commended, yet 100 are none too many for a generous family supply, and unless other fruits are grown in abundance the good housewife will readily know how to take care of all their product.

If your ground is ordinarily level, it is better to run your rows north and south, eight feet apart, setting the vines 10 feet apart in the row, giving a chance to spread the canes out five feet on either side when fully grown. If your vines are planted on a piece of strongly sloping ground, it is better to run the rows on the level around the slope, this arrangement enabling you to more readily prevent the heavy washing of the soil. The holes should be dug broad enough to enable all the small roots of the vines to be spread out fully. Prune away all damaged or bruised roots, and prune the top back to two or three buds. Set the vine but little deeper than it grew before; cover the roots with fine, moist earth, and press it firmly. This is of great

importance. The packing of fine earth well around the fibrous roots enables them to take hold readily upon the soil and make a vigorous growth.

A good stake should be driven to each vine, and the young canes as they grow may be caught up to this to keep them out of the way. Tomatoes or some such garden truck may be raised between the rows the first year. If the vines make a strong growth, they will be ready for the trellis the next year; otherwise it will be best to prune them back to two spurs of two buds each, and train them again to the stake the second season.

Give clean cultivation, and pinch the tips of the longest canes in the summer, if they are inclined to get too far from home.

For construction of the trellis, good, sound posts should be selected, of wood that will not soon decay. If you have cut down an old Osage hedge, or can get the posts from a neighbor who has, these are the very best. But secure durable material, as the trellis is to stand 15 or 20 years, and it pays to build well at the start. Set the posts 20 feet apart, or one to every two vines, and space them so as to divide the distance between the vines. The end post should be extra strong and deeply set; then brace them thoroughly, taking care not to have the brace too short and too high on the post, as the strain will tend to lift the posts out if you do. No. 12, smooth, galvanized wire is the best for a trellis. Use three wires, the first 22 inches from the ground, and the others 16 inches apart. It is well to bore the end posts and run the wires through. Staple them to the other posts, taking care not to drive the staples down closely enough to bind. Some device for tightening the wires should be attached at one end of the row, if the trellis is a long one; though simply drawing the wire through the hole till it is tight and twisting around the post will answer the purpose. The best material for tying up the canes that I know of is wool twine. This is sufficiently large and soft not to cut the vine, and strong enough for the purpose. Binding twine has been found too sharp, and cuts off quite easily upon the wires.

If the vines are rather young and small, two canes about three feet long will be all they should carry. At a year older, or with stronger vines, four canes may be put up, two on either side. Nothing is gained, however, by crowding young vines or allowing them to bear too much fruit while young and weak.

When well grown, or say the third year from setting, five or six canes may be saved, arranged in a fan-like manner upon the lower wires.

The pruning of vines is, to the beginner, the worst problem of grape raising. With the tangle of vines found on the wires at the end of a good year's growth, it is not strange that one feels at an utter loss to know where to begin or what to take. No fixed rule can be laid down, easy as the different systems may appear on paper.

Each vine must be given a little separate study. While a glance will show the expert what to do in each case, it will pay the beginner to take a little time to it. The natural thought is that the vine will be ruined by such severe pruning, and the tendency is to leave too much wood rather than to remove too much. I have seen very few vines injured by overpruning.

The time to prune is any time from the falling of the leaves in autumn until the sap begins to stir in the spring. A pair of shears good enough for the work on a few dozen vines can be bought at any hardware store at from 50 cents to \$1. If the vines are old, with large, old canes that should be removed, a pruning saw should also be provided.

With a well-defined plan in mind of what sort of a vine you want to leave when pruned, take a good look at your first vine to see how nearly this plan can be carried out. Remember that the bearing wood, as it is called, is the young wood of the past season's growth. From the buds on these canes will push branches, next

spring, which will set one, two, three, or even four, bunches of fruit near the base, and then continue to grow as a vine. What you want for bearing wood is a strong, healthy cane, with firm, well-ripened wood and sound, healthy buds. According to the age and strength of the vine, you want from two to six of these canes, two to four feet long, as well placed for fan-shaped arrangement as you can get them, and starting from the main vine as near the ground as can be selected.

The stronger growth in grape vines always tends to the top; hence, if you select your best canes, regardless of position, many of them will be high up, and you will be working your bearing wood further away from the ground, and would soon have it beyond the trellis entirely. Decide upon the canes you wish to leave, begin at the base of each, clip it clear of all tendrils and branches out to about four feet, or less if the wood is not well matured, and cut it off. Leave two or three short spurs of two buds each near the center at the base of the vine to produce renewal canes for next year. When this is done, your pruning of the vine is complete. The rest of the task is simply to clear the vine and trellis of useless canes. No, your vine is not ruined, and do not allow your wife or anybody else to make you think it is.

The prunings should be carefully gathered and burned, what you do not want to make cuttings of. There is a short, cylindrical, black beetle, dignified by the name of *Amphicerus bicaudatus*, which becomes a serious vineyard pest in some localities, working also on apple and some shade trees. Its work may be recognized by a round hole bored in the axil or forking of a branch. These beetles are harbored in old grape trimmings, and hence the importance of burning them.

In tying up the canes, they should be put on the two lower wires for the most part, and fastened in a somewhat curved position, rather than carried out straight. This slightly obstructs the flow of sap, and counteracts the natural tendency for the strongest growth to be made from the upper buds on the cane, while the lower ones suffer or do not start at all.

People who have seen our experiment station exhibit of grapes at state and national fairs have often remarked on the fresh appearance and perfect bloom of the bunches, and wondered how we could save so many of them from the birds. Inclosing each bunch in a No. 2 manilla grocery sack, held in place by a pin, will usually accomplish the result, though occasionally the birds become sharp enough to find out what is in those sacks, and will pick their way through. This bagging of the bunches tends to retard the ripening a little, and so prolong the season. It does not cost much, and a few hundred bunches inclosed in this way will help out the family supply wonderfully.

Having taken all this time to introduce my subject, I may as well now come to the point — the five best grapes for Kansas.

At the head of the list I should place the grand old Concord, the "grape for the millions." Mr. E. W. Bull, of Concord, Mass., did more for his country when he originated this variety of grape than did many a statesman whose name the people cherish. By all means plant the Concord if you have only one variety.

Very close to this comes the Worden's Seedling, offspring of the Concord. A few days earlier, a little better bunch, and a distinct flavor, are the distinguishing points. Whether it will prove to have the all-round staying qualities of its parent is yet to be found by longer trial, but its present record is good.

The most desirable white grape, all things considered, I believe to be the Hayes, or Francis B. Hayes, as it was first named. This, also, is a Concord seedling, entirely hardy, of pleasing appearance, delicate flavor, ripening a little earlier than the Concord, yet keeping its quality and firmness a long time. A late white grape, one of the very latest, is the Rommel's Etta. This possesses a strain of the *Riparia*, or common white grape blood, mingled with that of the *Labrusca*, the species to

which the Concord family belongs. This variety also possesses the hardiness, vigor and productiveness which I deem essential to this list. Its flavor is well marked, and, though not of the choicest, is yet very palatable. It is chiefly on account of its lateness that I give it a place here in preference to some others.

My fifth shall be a variety comparatively little known, the Woodruff, or Woodruff Red. This had its origin near Detroit, Mich., and it is claimed as a Concord seedling also, a statement which I am a good deal inclined to doubt. If this be true, it is the first and only red Concord seedling on record. The vines are good growers, hardy and abundant bearers, not having failed in the five years we have had them in bearing and producing three heavy crops. The bunch and berry are both very large and showy, of an attractive, bright red color. This is not entitled to first place in flavor, yet it is so good that we have never had any left on our hands. In fact, it is about as eagerly bought as any sort in our list of 150 varieties. When bagged, these bunches retain their flavor and appearance a long time.

After all, this part of my task, the naming of the best five varieties, is the least satisfactory part of my undertaking. Once we get beyond the Concord, there are a good many other hardy sorts of nearly equal merit to choose from, and I think I shall have to fall back on my original statement, that the five best grapes for the Kansas farmer are the five that he can be induced to plant and care for, feeling confident that, by the time the first five are in full bearing, he will be such a lover of grapes as to test others for himself.

FEEDING EXPERIMENTS WITH PIGS.

Perhaps the most extensive and carefully noted line of experimentation with pigs and pig feeding under one management is that which has been carried on for some years at the Wisconsin agricultural experiment station, under the direction of Prof. W. A. Henry, who has kindly placed the valuable summary of results at the service of the Kansas Board of Agriculture, and they are reproduced here from the tenth annual report of the Wisconsin station. These experiments cover four lines of effort:

1. A study of the quantity of food required for a given gain with young pigs before and immediately after weaning.
2. The amount of modification which the flesh and bones of the hog may undergo when supplying or withholding certain food articles.
3. The quantity of food required for a given gain with maturing hogs.
4. The effect of preparation of food on gain.

I.—A Study of the Quantity of Food Required for a Given Gain with Young Pigs Before and Immediately After Weaning.

EXPERIMENTS WITH PIGS BEFORE AND AFTER WEANING.

Four farrowing sows were selected for the experiments. The pigs were weighed as soon as born, and weekly thereafter until weaned. With three lots the pigs were induced to eat as much food as possible in addition to the milk supply of the mother, while the fourth lot were fed up to weaning on the dam's milk only. The meal fed to the sows and pigs consisted of half corn meal and half shorts. The skim milk was sweet when fed. The pigs were weaned when 70 days old.

TABLE showing result of feeding trials.

	Lot 1.	Lot 2.	Lot 3.	Lot 4.	Average.	Cost.
BEFORE WEANING.						
Number of days.....	55	59	59	64		
Number of pigs with sow.....	4	4	9	6		
Total gain of sow and pigs.....lbs.	160	139	243	160		
Food consumed:						
Corn meal and shorts.....lbs.	387	401	483	385		
Skim milk....."	901	903	1,591	845		
Food for 100 pounds of gain:						
Corn meal and shorts.....lbs.	241	288	198	240	242	} \$3 14
Skim milk....."	563	649	654	528	598	
AFTER WEANING.						
Number of days.....	46	42	28	30		
Number of pigs.....	4	4	8	5		
Total gain of pigs.....lbs.	156	144	195	154		
Food consumed:						
Corn meal and shorts.....lbs.	392	311	416	273		
Skim milk....."	916	832	877	835		
Food for 100 pounds of gain:						
Corn meal and shorts.....lbs.	251	215	213	177	214	} \$2 85
Skim milk....."	587	577	499	542	539	

The teaching of the trials is, that it pays to feed suckling sows so heavily that the dams will gain weight, when that is possible; for the cost of the gain made by the pigs and their dam is cheaper then than the gain of the same pigs when older.

COST OF FEEDING PIGS BEFORE AND AFTER WEANING COMPARED.

The purpose of this experiment was to ascertain whether or not pigs can be fed as profitably through the dam as after weaning. Four sows were placed in separate pens just before farrowing. The pigs were weighed on the day they were born, and weekly thereafter until 10 weeks old, when they were weaned. An account was kept of all the food consumed by the sow and the pigs before weaning, and also the quantity taken by the pigs for seven weeks after weaning. The feed consumed is charged at the following rates:

Corn meal, 70 cents per hundred weight, or 40 cents per bushel.
 Skim milk, 25 cents per hundred weight.
 Shorts, 70 cents per hundred weight.
 Ground oats, 90 cents per hundred weight, or 29 cents per bushel.
 Sifted oats, \$1.27 per hundred weight.

Only summaries of the second and third lots are here given, as the feeding was not uniform for the other lots.

The following table shows the food consumed to produce 100 pounds of gain:

Lot II.—Sow and pigs before weaning.

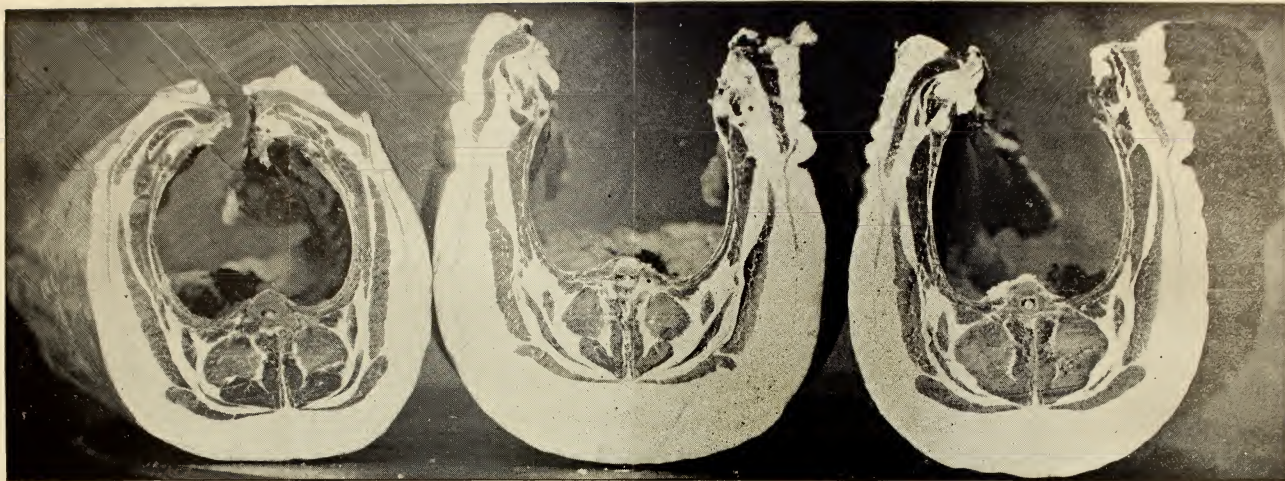
Corn meal, 184 lbs., at 70 cts. per cwt.....	\$1 29
Skim milk, 482 lbs., at 25 cts. per cwt.....	1 21
Total.....	\$2 50

Pigs after weaning.

Corn meal, 187 lbs., at 70 cts. per cwt.....	\$1 31
Skim milk, 562 lbs., at 25 cts. per cwt.....	1 41
Total.....	\$2 72

Lot III.—Sows and pigs before weaning.

Corn meal, 116 lbs., at 70 cts. per cwt.....	\$0 81
Shorts 232 lbs., at 70 cts. per cwt.....	1 62
Total.....	\$2 43

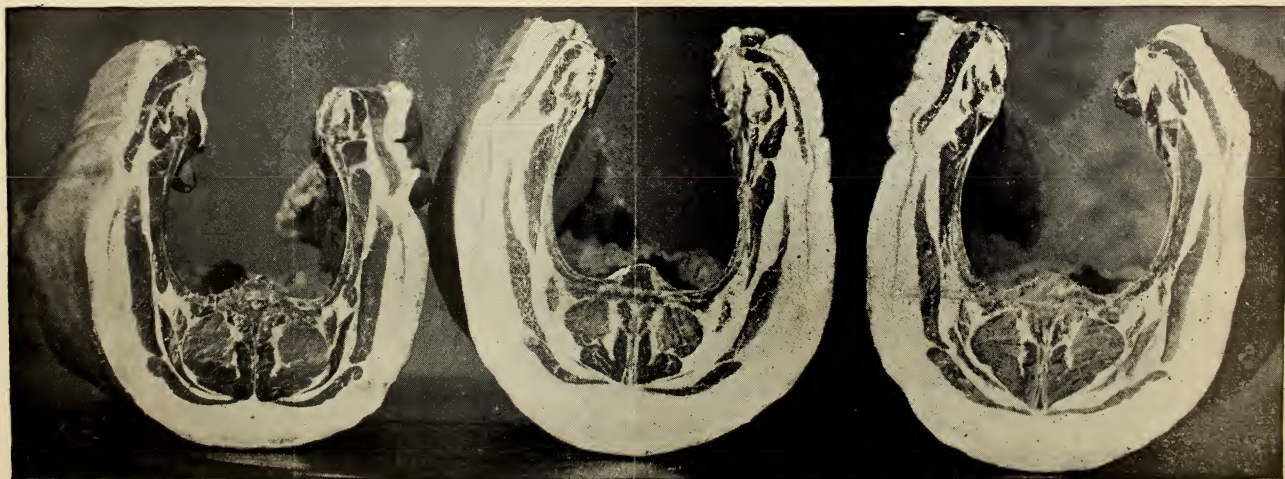


LOT A, No. 1.—SHORTS.

LOT B, No. 1.—CORN MEAL.

LOT C, No. 1.—SKIM MILK.

Cross sections over the heart, showing amount and distribution of fat and muscles in hogs fed on different diets for 98 days.

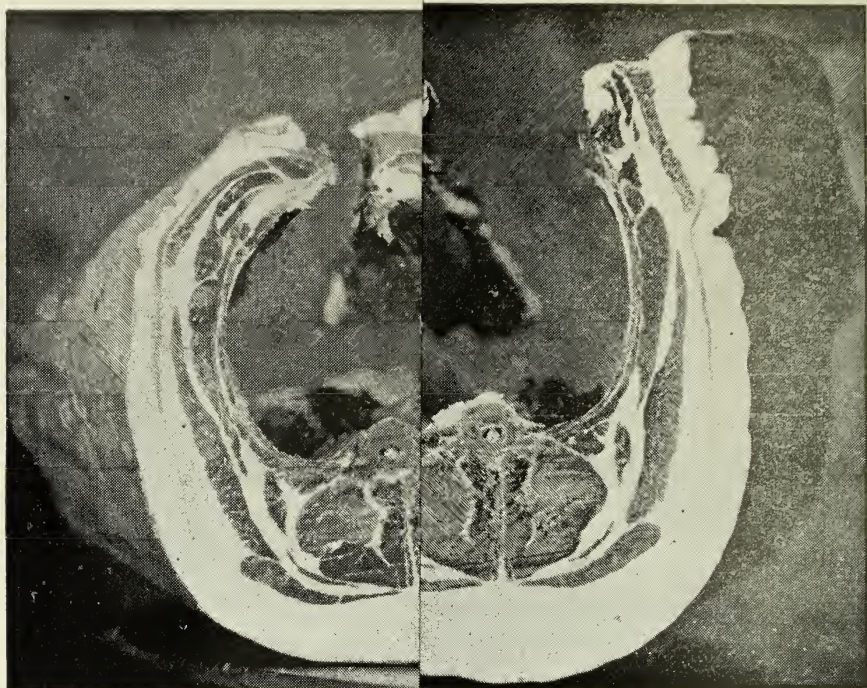


LOT A, No. 2.—SHORTS.

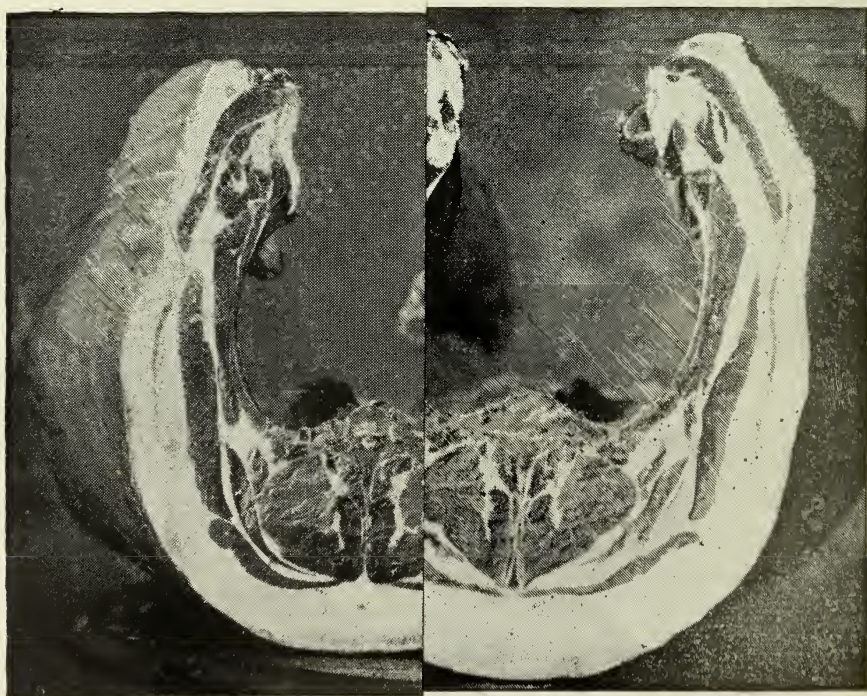
LOT B, No. 2.—CORN.

LOT C, No. 2.—SKIM MILK.

Cross sections over the heart, showing amount and distribution of fat and muscles in hogs fed on different diets for 98 days.



LOT A, No. 1.—SHEEP C, No. 1.—SKIM MILK.
Cross sections of heads on diets for 98 days.



LOT A, No. 2.—SHEEP C, No. 2.—SKIM MILK.
Cross sections of heads on diets for 98 days.

Pigs after weaning.

Corn meal, 115 lbs., at 70 cts. per cwt.	\$0 81
Shorts, 239 lbs., at 70 cts. per cwt.	1 61
Total.	\$2 42

The combination of corn meal and skim milk gave excellent results, and corn meal with shorts did equally well. Where the sow was fed ground oats, poor returns followed, this feed not being very satisfactory when cost is considered. It will be seen that there was little difference in the amount of feed required for a pound of growth with the pigs of lots II and III before and after weaning, and we may conclude that there is no cheaper way of feeding pigs than through the dam. This being true, it is a short-sighted policy to starve a sow, with the idea that her pigs will pay better for their feed after they have been weaned. Our experiments teach us that the sow should be fed as heavily as possible without endangering her young, and that at the same time the pigs should be early taught to eat in a trough by themselves, and should also be fed all they can consume. Comparing the results obtained before and directly after weaning, with those from older animals, we find that the best gains for a given amount of feed are made with young animals. To obtain the best results for a given amount of feed, pigs should be crowded from the day they are born, feeding the dam heavily and teaching the young pigs to eat separately from a trough before weaning, and continuing the heavy feed after weaning.

II.—Modification of the Carcass of the Hog by Feeding.

FEEDING FOR FAT AND FOR LEAN.

Experiments conducted by Prof. J. W. Sanborn at the Missouri agricultural college showed that the character of feed has a very marked influence on the composition of the meat in the carcass of the pig. The special object of the experiments here reported was to ascertain in how far the food will influence the character of the bone and muscle of the hog.

Six pigs of a litter of eight, 100 days old at the beginning of the experiment, were separated into two lots and fed as follows: Lot I, one part dry blood, six parts shorts, 14 parts sweet skim milk, by weight; lot II, fine-ground corn meal, all they would eat. Up to the time of the experiment, all pigs had been fed from the same trough on a mixture of shorts, corn meal, skim milk, and buttermilk. The experiment began June 25, lasted for 36 days, and gave the following results:

TABLE giving results of feeding trial.

	<i>Skim milk.</i>	<i>Shorts.</i>	<i>Dried blood.</i>	<i>Corn meal.</i>	<i>Weight of lot.</i>	<i>Gain.</i>
Lot I (fed for lean) lbs.	3,302	1,415.1	235.9	.....	264	405.2
Lot II (fed for fat ) . . . . .	.....	.....	.....	1,690	270	291.5

The analysis of digestible components of the rations fed are given; the ration fed to lot I contained more protein and less carbohydrates than did the ration fed to lot II, but the total dry matter fed was smaller in the former case, the ratio of the rations fed were 1:2 for lot I, and 1:7 for lot II.

The hogs were slaughtered on the completion of the experiment, and the data obtained as regards the weights and dimensions of internal organs, as well as the live and dressed weights, are given in the following table:

In this table the total weights for all three hogs are given in each case, thereby enabling us to present average figures.

TABLE showing results obtained at slaughtering time.

		<i>Fed for lean.</i>	<i>Fed for fat.</i>
Live weight of three hogs.....	lbs.	669.3	561.5
Dressed weight of three hogs.....	"	541.8	451.0
External fat.....	"	150.0	156.0
Lean meat.....	"	244.0	178.5
Total weight of kidneys.....	"	1.7	1.2
Total weight of spleens.....	"	1.0	0.8
Total weight of hearts.....	"	1.8	1.7
Weight of intestinal fat.....	"	13.9	15.2
Total length of large intestines.....	feet	49.0	52.5
Total length of small intestines.....	"	184.8	180.5
Total weight of livers.....	lbs.	9.2	6.8
Total weight of lungs.....	"	4.8	4.2
Total weight of blood obtained at slaughtering.....	"	18.5	11.7
Leaf lard.....	"	27.0	25.1
Weight of tenderloin muscles.....	"	5.8	3.9
Weight of large muscles of back.....	"	26.5	16.1
Weight of hair.....	"	4.8	3.5
Weight of six thigh bones.....	"	33.6	27.3
Total breaking weight of six thigh bones.....	"	4,550.0	2,855.0

The live weight of lot I was 19 per cent. greater than that of lot II, the dressed weight 21 per cent. greater, the kidneys 42 per cent. heavier, the spleen 33 per cent. heavier, the livers 32 per cent., the blood 59 per cent., the hair 36 per cent., the skin 36 per cent., the large muscles of the back (*Ilio spinalis*) 64 per cent., the two tenderloin muscles (*Psoas magnus*) 38 per cent., the bones 23 per cent., all heavier in lot I than in lot II. On the other hand, 38 per cent. of all the meat that could be cut from the carcasses of lot I was fat, while the fat from lot II was 46 per cent. of all that could be separated. The thigh bones of lot I were 65 per cent. stronger, with the testing machine, than those of lot II.

These reports, in connection with similar ones conducted elsewhere, show that when we feed to our large hogs a ration rich in carbohydrates, but lacking in protein, like corn meal, we will find:

1. That there is an excessive development of fat, not only on the outside of the muscles and beneath the skin, but also between the muscular fiber.
2. That the muscles of the body fail to develop to their normal size, especially some of the most important ones, as those along the back.
3. That an abnormally small amount of hair and a thin skin results.
4. That while the brain, heart and lungs do not seem to change in weight, the spleen, liver and kidneys are unusually small.
5. The amount of blood in the body is greatly reduced from the normal.
6. The strength of the bones may be reduced one-half.

EFFECT OF CORN MEAL SHORTS AND SKIM MILK ON THE CARCASS AND INTERNAL ORGANS OF THE HOG.

Three lots of pigs, of three each, 100 days old at the beginning of the experiment, were fed from December 15, 1887, to March 22, 1888 (98 days), on the following rations: Lot I, two-thirds shorts, one-third corn meal; lot II, corn meal only; lot III, one-third corn meal, two thirds sweet skim milk. The following table gives the main results of the feeding.

TABLE showing feed given, gain, etc.

	Corn meal.	Shorts.	Skim milk.	Weight at beginning.	Gain.	Food required for 100 lbs. of gain.		
						Corn meal.	Shorts.	Skim milk.
Lot I. shorts.....lbs.	272.7	545.3	.....	145	162	168	337	.....
Lot II, corn meal..... "	942	.....	.....	146	202	466	.....	.....
Lot III, skim milk..... "	638	.....	1,962.3	142	239	266	.....	821

Two hundred pounds of corn meal were saved by feeding lot III 821 pounds of skim milk, or 100 pounds of skim milk were worth about 25 pounds of corn meal.

TABLE showing the results obtained at slaughtering time, in totals.

WEIGHTS.	Lot I.	Lot II.	Lot III.
Live weight of two hogs.....lbs.	302.5	350.5	397.5
Dressed weight..... "	242.8	293.5	332.0
Total weight of hearts..... "	1.3	1.1	1.4
Total weight of lungs..... "	2.6	2.4	3.0
Total weight of blood..... "	10.8	9.6	10.0
Total weight of livers..... "	4.8	3.8	5.2
Total weight of kidneys..... "	0.8	0.7	0.9
Total weight of spleens..... "	0.4	0.3	0.5
Total weight of intestinal fat..... "	5.5	8.6	8.5
Total weight of hair..... "	1.7	1.7	2.1
Total length of large and small intestines combined.....ft.	136.7	133.9	143.3
Total breaking strength of six thigh bones.....lbs.	3,080.0	3,010.0	4,380.0

The relation between the weights of blood, liver, kidneys, spleen and bones to the dressed weight of the hogs in this and the experiment reported on page — is shown in the following table:

TABLE showing ratio of blood, etc., to dressed carcass.

LOTS.	Blood.	Liver.	Kidneys.	Spleen.	Strength of thigh bones.
FIRST EXPERIMENT.					
I, fed 3.5 parts milk to 1 of corn meal.....Per cent.	2.92	1.89	.366	.17	531
II, fed 1 part milk to 1.1 of corn meal..... "	3.55	1.99	.336	.20	522
III, fed 1 part milk to 3 of corn meal..... "	3.50	1.69	.276	.17	426
SECOND EXPERIMENT.					
I, fed 1 part corn meal to 2 of shorts.....Per cent.	4.46	1.98	.341	.18	634
II, fed corn meal..... "	3.26	1.30	.234	.12	513
III, fed 1 part corn meal to 2 of milk..... "	3.02	1.56	.282	.15	659

A few points seem to stand out plainly in these figures:

1. In regard to the amount of blood secured at killing time from the different lots, it would seem that the feeding of milk does not increase the percentage of blood over the feeding of corn meal. We get a smaller per cent. of blood in lot III of the second trial, fed milk, than with lot II in the same trial, fed on corn meal. In the first trial, the hogs receiving the most milk gave the smallest percentage of blood. From feeding shorts, we obtain the large amount of nearly $4\frac{1}{2}$ pounds of blood to 100 pounds of dressed weight. The reader will notice by examining the cuts presented that the muscles of the hogs fed on shorts appear dark, indicating the deep red color of the lean meat, while that of the corn-fed animals appeared very light colored and bloodless. The milk-fed hogs gave an intermediate colored meat.

2. Milk and shorts each increase the weight of the liver over that produced by feeding corn meal.

3. Milk and shorts each increase the weight of the kidneys over corn meal.

4. Regarding the strength of the bones we have no doubtful figures to perplex us. Where the most milk was fed the bones were the strongest. Shorts made a strong bone, but not quite equal to that produced by milk.

If, by difference in feeding, we can put nearly 4½ per cent. of blood into one lot of hogs, with only 3½ per cent. in another, and can make a difference of one-sixth in the strength of the bones in these two lots in less than 100 days, what a wide difference we can bring about by methods of feeding. If the bones of a corn-fed hog are less strong than they should be by one-sixth, and these hogs are used as breeding stock, what fatal changes may be produced in a few short generations. Our experiments may be said to represent extreme cases, but the figures may be divided several times and yet be startling in their significance.

Herewith are photo reproductions showing cross section of carcasses, the cut being made between fifth and sixth ribs. Not only are the relative proportion of fat to lean and the size of the muscles shown in cross section, but the lighter and darker shades of the lean meat are easily noted.

THE EFFECTS OF DRIED BLOOD, PEA MEAL AND CORN MEAL ON THE CARCASS, BONES AND VISCERA OF HOGS.

Two litters of six pigs each, one 131, the other 132 days old, were fed 143 days and 149 days respectively. Each litter was divided into three lots of two each, weighing about 100 pounds per head; all were supplied with fresh hard-wood ashes, salt, and hard well water. The first two pigs in each litter were fed a ration of one-third dried blood and two-thirds corn meal; the second two received corn meal and pea meal, half and half, while the third two in each litter were fed corn meal only. The animals were slaughtered at the completion of the trial and the viscera and the blood weighed separately. The following table presents some of the results obtained in feeding and at slaughtering time:

TABLE showing weights, gains, and costs of gain.

FEED.	Average weight at beginning.	Gain during trial.	Food eaten.	Food for 100 lbs. of gain.	Cost of 100 lbs. of gain.
Dried blood.....	191	405	1,658	409	\$3 95
Pea meal.....	195	360	1,611	448	4 36
Corn meal.....	198	311	1,493	480	3 36

The hogs fed dried blood had most blood, while the smallest quantity of blood was obtained from the hogs fed corn meal; the blood of the former lot also contained the largest percentage of dry matter, while the latter contained the lowest percentage. The relation of the weight of the internal organs to dressed weight was as follows:

TABLE giving data relative to blood and kidneys.

	Fed dried blood.	Fed peas.	Fed corn meal.
Grams of dry matter in blood, per pound of dressed weight.....	3.23	3.10	2.98
Grams of liver, per pound of dressed weight.....	6.29	6.02	5.04
Grams of kidney.....	1.105	.967	.788
Grams of dry matter in kidneys, per pound of dressed weight.....	.234	.244	.207

There was nearly 2 per cent. more fat in the kidneys of the corn-fed hog than in

the kidneys of the other two lots. Omitting the fat and figuring upon the proportion of kidneys to dressed weight, there was 17 per cent. more dry matter in the kidneys of the blood-fed hogs, and 24 per cent. more dry matter in the kidneys of the pease-fed hogs than in the kidneys of the corn-fed hogs. By analysis of the sixth-rib cut and the tenderloin muscle of the carcass, it was found that there was a difference of 7.6 pounds of lean meat per 100 pounds of carcass in favor of the blood and pease-fed hogs, or, expressing it in another way, the carcass of the blood and pease-fed hogs contained 40 per cent. more lean meat than the corn-fed hogs.

FEEDING FOR FAT AND LEAN.

In 1889, Prof. E. M. Shelton, of the Kansas experiment station, reported that he found no difference between the muscles and bones of hogs fed on shorts and bran and those fed on corn. In this work he started with animals from 9 to 10 months old. Wishing to find out if the feed used by him would produce similar results with younger animals, our experiment began October 28, 1889, with pigs between four and five months old, previously fed on corn and barley. There were three pigs in each lot. Lot I was fed a ration of two parts shorts and one part bran; lot II received corn meal. Professor Shelton's second report having come out during the progress of this trial, in which it was shown that with young pigs there were the differences claimed by Sanborn and myself, at the close of 13 weeks we concluded to change it somewhat, giving the pigs which had been fed shorts and bran corn meal instead, while those receiving corn meal were continued on the same feed. For a time, after the experiment began, both lots made equal gains; but as time progressed, poorer and poorer gains were recorded, the corn-meal hogs finally eating little food, and making but slight gains. Upon being changed from the shorts-bran to corn meal, lot I made very satisfactory gains during the six weeks they were fed on the new feed.

At slaughtering time, the carcasses of the hogs fed on shorts-bran showed the most lean meat, the excess being about 17 per cent., as shown by chemical analysis for that portion of the body surrounding the heart. The blood caught at slaughtering time showed about 33 per cent. excess for lot I over lot II, and the livers showed an equal difference, by weight. It required a pressure of 661 pounds on the average, to break a thigh bone from the hogs fed on shorts-bran, while for those fed on corn 449 pounds were required. Figured on dressed weight, there was not much difference between the two, but still in favor of the shorts-bran-fed hogs.

Our investigations showed the following points in favor of the shorts-bran-corn-fed hogs over those getting corn only:

1. A far more rapid growth.
2. A much more economical gain for food consumed.
3. Much more blood in the body.
4. Larger livers.
5. A larger proportion of lean meat or muscle to fat.
6. A larger proportion of ash to a given volume of bone.
7. Somewhat stronger bones in proportion to the weight of body.

Our experiments lead us to affirm that the carcass of growing pigs is greatly affected by the character of the food given. If corn is fed and nitrogenous food withheld, the pigs will become dwarfed and fatten prematurely, with weakened bones, diminished blood, and reduced vital organs. On the other hand, after the pigs have reached seven or eight months' age, there is far less necessity for nitrogenous foods, and the cheapest gains can be made with corn.

The use of the phrase adopted by Professor Sanborn, "feeding for fat and for lean," has led to misconception on the part of many readers, perhaps, and

some writers. It would appear that some suppose it possible, after reading these experiments, for the feeder to put fat or lean on his animals at will by regulating the kind and amount of food given. The writer early took a view of this subject which time has not led him to materially change. In the fourth annual report of this station, page 96, appears the following, which perhaps presents his view on the matter as well as could be given after years of further investigation and thought on the matter:

"All through this discussion we have carried the impression that we could put lean meat or fat on the hog at will; but can we? Is it not true that in every animal there is a certain limitation to muscular development, beyond which it cannot go? The blacksmith or the baseball player develops a large amount of muscle, but the limit is not very high, after all, with them, and probably a man weighing 175 pounds cannot add, either by what he eats or the exercise he takes, over a few pounds of real meat or muscle to his body; indeed, when men go 'into training' they reduce their weight, as a rule, instead of increasing it, getting rid of fat and water in the body. On the other hand, when men have a tendency to laying on fat the limit they may reach may double their normal weight. We may say then that the possible muscular development of an animal has a narrow limit, comparatively, while the possible fatty development has a much wider range.

"We should hold then, it would seem, that our hogs which show the best muscular development are only normally developed, or at least have not departed far from the normal, and that whatever we find in them is a condition to be held as a standard, while our hogs which have grown fat and show a variation from the lean hogs are abnormal."

EFFECTS OF RAIN WATER, WELL WATER AND BONE MEAL ON THE GROWTH OF CARCASS
AND STRENGTH OF BONES OF PIGS.

A litter of pigs, separated into three lots of two each, was fed for 149 days in the following manner:

Lot I, corn meal, rain water, salt, ground bone meal.

Lot II, corn meal, rain water, salt, no bone meal.

Lot III, corn meal, hard well water, salt, no bone meal.

The bone meal fed was that sold for fertilizing purposes, of excellent quality, and ground about as fine as coarse corn meal. The pigs weighed from 58 to 70 pounds at the beginning of the trial. The following table includes the more important results obtained:

TABLE showing results of trial.

	FOOD EATEN.		Total gain.	Food for 100 pounds gain.	Average breaking strength of thigh bone.
	Corn.	Bone meal.			
Lot I.....lbs.	1,096	31	246	454	890
Lot II....."	1,106	.....	210	526	500
Lot III....."	1,034	.....	180	574	442

Supplying well water seems to give no advantage over rain water; indeed, the results are against it, both as to gain made, feed required for 100 pounds of gain, and breaking strength of thigh bone. The feeding of the bone meal greatly increased the strength of the bones. The experiment was not entirely satisfactory on account of the poor gains made by two pigs.

BONE MEAL *versus* HARD-WOOD ASHES WITH CORN MEAL FOR HOGS.

Two lots of pigs of two each, 105 days old, were fed for 128 days as follows :

Lot I, corn meal, ground bone, salt, rain water.

Lot II, corn meal, hard-wood ashes, salt, rain water.

Lot III, corn meal, salt, rain water.

The pigs weighed 49 to 94 pounds each at the beginning of the trial. The results of feeding are summarized in the following table :

TABLE showing results of feeding trial.

LOTS.	Food given, lbs.					Total gain, lbs.	Lbs. of feed for 100 lbs. gain.	Average breaking strength of thigh bones.	Ash of thigh bones of lot, grams.
	Corn meal.	Bone meal.	Ashes.	Rain water.	Salt.				
I.....	830	16	.....	1,708	9	160	518	817	164.0
II.....	815	.....	30	1,693	9	158	515	625	138.1
III.....	660	.....	.....	648	9	116	568	205	87.6

As a consequence of feeding a pinch of ground bone or one handful of wood ashes daily to hogs living on a corn-meal diet, we note:

One-third more salt consumed.

Nearly three times as much water drank.

Almost one-fourth more corn meal eaten.

More than 50 pounds of corn meal saved in making 100 pounds of gain, live weight.

More than twice the strength of bone.

Almost twice the amount of ash in the bones.

CONCLUSIONS DRAWN FROM EXPERIMENTS ON THE EFFECTS OF VARIOUS FOOD RATIONS ON THE CARCASS OF HOGS.

1. Hogs on a corn ration have less blood in their bodies, have smaller liver, kidneys, skeleton, and lighter skeleton and hide, than have hogs on mixed rations.

2. For the market price, or cost of production in the great West, Indian corn is beyond all comparison the cheapest single food article for hogs.

3. Hogs will live a long time and make a fair gain upon an exclusive corn ration.

4. When kept upon such a ration they grow quite fat, but, when yet small, have the form and appearance of mature hogs, being dwarfed in size.

5. The carcass of the hog on corn rations contains more fat and less water than does the carcass of the hog on mixed ration.

6. The carcass of the hog on corn ration may contain a quarter less muscle or lean meat than that fed on mixed ration.

7. The bones of the hog on corn ration have much less strength than those of the hog on mixed ration.

8. Hogs living on corn meal, water and salt did not seem to have their bones strengthened by feeding well water instead of rain water.

9. Hogs living on corn meal, salt and rain water had their bones doubled in strength by feeding hard-wood ashes, and still further strengthened by feeding ground bone.

10. Hogs fed on ground bone or hard-wood ashes had the ash material of their bones about doubled in amount, ground bone giving better results than wood ashes.

11. Hogs living on corn meal, salt, and water, when fed ground bone or ashes, drank more water, consumed more food and made much heavier gains than those not getting ground bone or ashes.

12. There was no increase of muscle with the hogs on the corn ration getting

ground bone or hard-wood ashes over those on the same food getting no ground bone or ashes.

13. While the body of the hog, perfect or imperfect, is the result of inheritance, it can be directly modified by the kind of food given.

EFFECT OF FEEDING BONE MEAL AND HARD-WOOD ASHES TO HOGS LIVING EXCLUSIVELY ON CORN.

Our experiments in feeding for fat and lean show that corn does not of itself build up strong bones in hogs. Careful feeders have long practiced giving ashes and other substances to hogs, claiming that the animal was benefited thereby. Our work pointed out that it was possible with such materials to strengthen the bones, besides, perhaps, assisting digestion. Four experiments have been conducted at this station in which bone meal and hard-wood ashes have been fed to hogs living on corn, and as they all run the same way, the good effects reported seem assured.

The pigs were fed on corn and rain water, lot I receiving a pinch of bone meal, made from ground bones, daily, in the feed; lot II was fed hard-wood ashes in a separate trough; lot III received nothing of this kind. All lots received salt. The experiment was continued with first trial 84 days, and with the second trial 112 days. The animals were slaughtered and a careful examination made of the internal organs, but no difference of the proportion of the fat and lean meat was detected, nor did the feeding of ashes or bone meal seem to have any effect on the amount of blood.

The thigh bones were cut out from the hams, and their breaking strength determined. After breaking the thigh bones, they were placed in muffle and burned. The following table shows the results of the two trials of this year. The other trial of last year, not being in all parts parallel, has been omitted:

TABLE showing summary of the trials with feeding bone meal and hard-wood ashes.

AVERAGE OF THREE TRIALS.	When bone meal was fed.	When ashes were fed.	When neither was fed.
Corn meal required to produce 100 lbs. of gain.....lbs.	487	491	629
Breaking strength of thigh bones....."	680	581	301
Ash of thigh bones.....grs.	165.8	150.2	107 grms.

From the figures, we conclude that, as a result of these experiments with giving or withholding bone meal or hard-wood ashes from growing hogs fed exclusively on corn:

1. The effect of the bone meal and ashes was to save 28 per cent. of the corn required to produce 100 lbs. of gain. This shows that ashes are an important aid to digestion where much corn is fed.

2. That by feeding bone meal we more than doubled the strength of the thigh bones; ashes nearly doubled the strength of the bones.

3. There was about 50 per cent. more ash in the bones of the hogs receiving bone meal or hard-wood ashes than in the bones of those not so fed.

The ashes and bone meal seem limited to building up the bones and aiding digestion, but this is enough to give them a high value with any farmers who feed much corn. Hard-wood ashes seem to do the work about as well as ground bone, so that most farmers have the desired material at hand for the mere saving. Farmers whose hogs become too fine in bone have in hard-wood ashes a substance which will help prevent that trouble.

III.—Quantity of Food Required for a Given Gain.

FEEDING SWEET SKIM MILK TO PIGS.

Two lots of pigs with two in each lot, 86 days old, were fed fresh-cut clover, and in addition lot I was fed sweet skim milk twice a day, and lot II, corn meal soaked in water until it soured slightly. The skim milk was from a Cooley creamer and contained about .3 per cent. fat. The feeds were reversed during the second period of the experiment. The food eaten and gain made are shown in the following table :

TABLE showing results of feeding skim milk.

LOTS.	Length of period, days.	Skim milk, lbs.	Corn meal, lbs.	Cut clover, lbs.	Gain, lbs.	Pounds of food required for 1 lb. of growth.		
						Skim milk.	Corn meal.	Clover.
I.....	25	1,168	.....	77	50.5	23.1	.....	1.5
II.....	25	.....	169	154	42.8	.....	4.0	.....
II.....	25	1,264	.....	.....	79.0	16.0	.....	.....
I.....	25	.....	253	.....	61.5	.....	4.1	.....

The pigs seemed to care but little for clover during the second period and wasted so much of it that we discontinued feeding it. The experiment ended September 16, 1881. We may say roughly that four pounds of corn meal equal 20 pounds of sweet skim milk, or one pound of the former is equal to five pounds of the latter, where each is fed separately. If corn meal is worth \$1 per 100 pounds, sweet skim milk will then be worth 20 cents per 100 pounds, under these conditions.

SKIM MILK FOR MATURE HOGS *versus* GROWING HOGS.

Four grade Poland-China hogs, separated into two lots of two each, were fed for 63 days, the feed being all the skim milk they could drink, with a little corn meal stirred into it, in addition. The hogs in lot I were 255 days old at the beginning of the trial, and averaged 400 pounds each in weight. The hogs in lot II were 126 days old and averaged 144 pounds each. The feed eaten and gain made are shown in the following table :

TABLE showing results of trial.

LOTS.	Feed consumed.		Gain.	Food required for 100 pounds gain.	
	Corn meal.	Skim milk.		Corn meal.	Skim milk.
I, mature hogs.....lbs.	531	2,764	193	301	1,430
II, growing hogs....."	286	1,680	164	174	1,024

SWEET SKIM MILK *versus* BUTTERMILK FOR PIGS.

Two lots of pigs of three each, 114 days old at the beginning of the trial, were fed for 96 days in the following way: Lot I received sweet skim milk from a Cooley creamer; lot II received fresh buttermilk. Both lots were fed shorts and corn meal in addition, $2\frac{1}{2}$ pounds of corn meal and $2\frac{1}{2}$ pounds of shorts being mixed with 10 pounds of skim milk or buttermilk. The pigs received as much as wanted of the mixture. The results of the trial were as follows :

LOTS.	Skim milk.	Butter-milk.	Corn.	Shorts.	Grain.
I.....lbs.	2,890	.....	722.5	722.5	420.5
II....."	.....	2,890	722.5	722.5	382.0

Valuing the shorts and corn meal at \$15 and the hogs at \$5 per 100 pounds, live weight, the sweet skim milk would have a value of 35 cents per 100 pounds, and the butter milk 28 cents per 100 pounds.

THE FEEDING VALUE OF WHEY.

Four trials were conducted, with from 12 to 16 hogs in each trial. Whey was fed with corn meal and shorts in varying proportions, or with shorts alone. The final results are given in the following table of summary:

TABLE showing weight of pigs, quantity of feed consumed, the gain, and the amount of whey required to save 100 pounds of meal.

Lots.	Feed consumed.		Total gain.	Feed for 100 pounds gain.		Meal saved by whey.	Whey for 100 pounds meal.
	Meal.	Whey.		Meal.	Whey.		
First trial—Average weight of animals, 127 pounds.							
I.....lbs.	486.0		105	463			
II....."	504.0	1,058	154	327	687	136	505
III....."	300.5	2,124	117	257	1,815	206	881
IV....."	215.5	2,226	119	181	1,871	282	663
Second trial—Average weight of animals, 240 pounds.							
I.....lbs.	627.5		101	621			
II....."	627.5	1,856	161	390	1,153	231	499
III....."	453.0	2,676	124	365	2,158	256	843
IV....."	347.5	3,459	132	263	2,620	358	732
Third trial—Average weight of animals, 140 pounds.							
I.....lbs.	632.5		130	486			
II....."	632.5	1,871	170	372	1,100	114	964
III....."	454.0	2,710	157	289	1,726	197	876
IV....."	352.5	3,509	152	232	2,309	254	909
Fourth trial—Average weight of animals, 323 pounds.							
I.....lbs.	543.0		85	639			
II....."	383.5	2,297	111	346	2,069	293	706

The results of these trials show:

1. We were not successful in maintaining pigs on whey alone.
2. Pigs fed on corn meal and shorts with water required 552 pounds of mixture for 100 pounds of gain.
3. When whey was added to the corn meal and shorts mixture, it produced a marked saving in the quantity of grain required for good gains. This was true of mixtures varying from two pounds of whey to one of grain, up to 10 pounds of whey to one of grain.
4. It was found, when using whey as a partial substitute for grain, that 758 pounds of whey effected a saving of 100 pounds of the corn meal and shorts mixture.
5. Using these figures, if corn meal and shorts are valued at \$12 per ton, then whey is worth 8 cents per 100 pounds; at \$15 per ton for the corn meal and shorts, whey would be worth 10 cents per 100 pounds.
6. Shorts, pea meal, and oil meal, or like feeds, should be mixed with whey for growing animals. Some corn may be fed at all times, the proportion increasing as the animal approaches maturity.

CORN MEAL AND SKIM MILK FOR PIGS.

Six pigs, weighing 734 pounds, running in an open yard, sleeping in a shed, were fed one pound of corn meal to three pounds of sweet milk; the trial began February 24, and lasted 55 days; the results were as follows:

Average weight of pigs	122 lbs.
Skim milk fed.....	4,716 "
Corn meal.....	1,572 "
Gain.....	496 "

It required 951 pounds of skim milk and 317 pounds of corn meal for each 100 pounds of gain.

SKIM MILK AND CORN MEAL FOR PIG FEEDING.

Three lots of pigs of three each were fed milk and corn in varying proportions. Lot I was fed 350 pounds of skim milk to 100 pounds of corn meal; lot II, 100 pounds skim milk to 110 pounds corn meal; and lot III, 100 pounds skim milk to 300 pounds corn meal. The nutritive ratio of these rations were as 1 to 4, 1 to 6, and 1 to 7, respectively. The pigs in the different lots weighed 116, 108 and 108 pounds respectively. The experiment began July 15 and lasted for 135 days. The food eaten and gain made are shown in the following table:

TABLE showing weights and gains with pigs.

LOTS.	Milk consumed.	Corn meal.	Gain.	Food required for 100 lbs. of gain.	
				Milk.	Corn meal.
I.....lbs.	4,140	1,183	553	748	214
II....."	1,117	1,229	424	263	289
III....."	421	1,263	372	113	339

Lot I consumed relatively more feed and made the most rapid gain. By feeding 635 pounds more skim milk to lot I than to lot III there was a saving of 125 pounds of corn meal; by feeding 150 pounds more milk to lot II than to lot III, there is a saving of 50 pounds of corn meal in producing 100 pounds of pork, or, at \$15 per ton for corn, we obtained a value of 25 cents per 100 pounds for milk thus fed. The most economical mixture of skim milk and corn meal was a pound or a pound and one-half of skim milk to each pound of corn meal.

The pigs were slaughtered on the completion of the experiment. We give below some of the main results of the numerous data obtained at slaughtering time:

TABLE showing results of trial.

WEIGHTS.	Lot I.	Lot II.	Lot III.
Total live weight.....lbs.	659.0	521.0	461.0
" dressed weight....."	548.0	415.8	373.3
" weight of hearts.....oz.	34.0	31.5	23.5
" " of blood....."	256.0	237.0	210.0
" " of livers....."	166.0	133.0	101.5
" " of kidneys....."	33.5	22.0	17.0
" " of spleens....."	16.0	13.3	10.5
" " of intestinal fat....."	185.0	151.0	141.0
" " of leaf lard....."	393.0	268.0	299.0
Length of intestines.....ft.	244.7	230.3	217.0
Breaking strength of thigh bones.....lbs.	5,830.0	4,350.0	3,180.0

WHOLE CORN versus CORN MEAL FOR HOGS.

Two groups of six heavy hogs and four light hogs were each divided into two lots of three and two, respectively. To one of the lots in each group were fed one pound of sweet skim milk with two pounds of shelled corn, and to the other lot in each group the same feed with the corn ground. The trials began in May, 1888,

lasted for 60 days, and were divided into two periods. The feed consumed and gains made were as follows :

TABLE giving results of feeding trials.

	Feed given.			Average live weight at beginning.	Gain.	Food for 100 pounds of gain.		
	Whole corn.	Corn meal.	Skim milk.			Skim milk.	Corn meal.	Whole corn.
Heavy hogs.....lbs. {	.....	1,210	605.0	288	330	183	366	.....
	1,201	.....	600.5	290	250	240	.....	480
Light hogs..... " {	.....	794	397.0	204	198	200	400	.....
	614	.....	307.0	194	170	180	.....	360

The heavy hogs gave the best results when on corn meal, and the light hogs when on whole corn. It required in these trials 766 pounds of corn meal, in addition to the skim milk fed, to produce 200 pounds of pork, while it required 840 pounds of whole corn, a saving of 74 pounds, or only about 10 per cent., by grinding the corn, an amount scarcely sufficient to pay for the grinding.

FEEDING CORN ALONE TO HOGS.

Six hogs divided into even lots were fed corn on the cob, with warm water to be drunk. They were fed from February 3 to March 3, 1886, with the following results:

TABLE showing results of feeding trial.

LOTS.	Weight at beginning.	Corn eaten.	Gain.	Value of corn at 25 cts. bu.	Cost of 100 lbs. of gain.
I (three hogs).....lbs.	652	756	92	\$4 42	\$4 80
II (three hogs).....lbs.	692	792	90.5	4 62	4 60

CORN MEAL, SHORTS, AND A MIXTURE OF THE TWO, AS A FOOD FOR PIGS.

Nine pigs, divided into three lots of three each, were fed for 42 days on the following feeds: Lot I, corn meal; lot II, roller-process shorts; lot III, corn meal and shorts, half and half (by weight); the feed was mixed with water and left until beginning to sour. The chemical composition of the feeds are given in this report. The pigs were 100 days old at the beginning of the trial, July 20.

TABLE showing results of feeding trial.

LOTS.	Weight of pigs at beginning.	Gain.	Food eaten.	Value of food eaten.	Food for 1 lb. of growth.	Cost of food for 100 lbs. of growth.
I, corn meal.....lbs.	188	104	558.5	\$4 46	5.3	\$4 30
II, shorts..... " "	176	95.5	501	3 50	5.3	3 70
III, mixture..... " "	185	107	469.5	3 51	3.3	3 30

The mixture of corn meal and shorts produced the best results, the pigs gaining faster and eating less by about one-fourth than when fed on corn meal alone. The manure from the pigs fed shorts is worth fully twice as much as that made by feeding an equal quantity of corn.

CORN AND SHORTS AS FOOD FOR HOGS.

Two lots of three hogs each, the same animals in part as were used in the preceding trial, were fed three parts of corn in the ear and one part of shorts by

weight. The experiment began January 6, and lasted for 28 days. Both lots were fed alike.

TABLE showing results of feeding trial.

LOTS.	Weight at begin- ning.	Corn.	Shorts.	Value of feed.	Gain.	Cost of feed for 100 lbs. of growth.
I.....lbs.	550	449.0	224.5	\$4 18	102	\$4 10
II....."	587	497.3	248.7	4 61	105	4 40

WHOLE OATS VS. GROUND OATS FOR HOGS.

Four lots of hogs of three each were fed for 120 days on different proportions of oats (ground or whole) and corn meal. The hogs were 108 to 125 days old, and weighed 94 to 126 pounds at the beginning of the first trial, December 13. The main results of the feeding trials will be found in the following table:

TABLE showing average results of feeding trials.

RATION.	Lot.	Oats whole, lbs.			Lot.	Oats ground, lbs.		
		Feed eaten.	Gain.	Food for 100 lbs. gain.		Feed eaten.	Gain.	Food for 100 lbs. gain.
Two-thirds oats and one-third corn meal, 2 trials each	II, III	1,338	246	568	I, IV	1,593	371	429
One-third oats and one-third corn meal, 2 trials each ...	I, IV	1,457	296	492	II, III	1,839	457	403

The poorest result was obtained from the ration composed of two thirds whole oats and one-third corn meal, and the next poorest, where one-third whole oats were fed with two-thirds corn meal. By cutting down the oats of the ration from two-thirds to one-third, substituting corn for the oats, there was a saving of 76 pounds on 668 pounds (13.4 per cent.) The best results ever attained in any feeding trial at this station with hogs as old as these were found when the ration consisted of one-third ground oats to two-thirds corn meal.

For older hogs, especially brood sows, when maintenance and not rapid gain is desired, the experience of some of our most careful stockmen shows that oats can be fed unground with the best of results. They should then be scattered thinly over the feeding floor, so as to induce slow eating and thorough mastication.

GROUND BARLEY FOR FATTENING HOGS.

Barley Meal vs. Corn Meal.—The purpose of this experiment was to determine the value of barley in comparison with corn for hog feeding. In the first trial 10 hogs, 14 months old, were divided into two lots of five each. To the first lot was fed barley meal, while the second received corn meal. The experiment continued eight weeks, during which time the first lot of hogs consumed 2,832 pounds of barley meal, and gained 601 pounds. In the meantime the second lot of hogs consumed 3,100 pounds of corn meal, and gained 713 pounds. From this we find that:

Lot I required 471 pounds of barley meal for 100 pounds gain.

Lot II required 435 pounds of corn meal for 100 pounds gain.

This shows that it required 36 pounds or 8 per cent. more barley meal than corn meal to produce 100 pounds of gain. In this experiment both feeds were soaked with water. It was found that it required about three pounds of water to properly soak a pound of barley meal, while a pound of corn meal required but two pounds

of water. The hogs fed on barley meal consumed 30 pounds additional of water daily in the soaked feed. Even with this large quantity of water in the feed, the barley hogs drank two pounds extra each, daily, from a separate trough, while the corn-meal hogs drank but three-quarters of a pound each.

Barley Meal and Skim Milk, Corn Meal and Skim Milk.—In this experiment the pigs were about five months old at the beginning of the trial. There were six pigs in each lot. Lot I was fed barley meal and sweet skim milk; lot II, corn meal and sweet skim milk. The experiment lasted nine weeks, during which time lot I consumed 1,993 pounds of barley meal, 2,404 pounds of sweet skim milk, and gained 604 pounds. In the same time lot II consumed 1,807 pounds of corn meal, 2,192 pounds of sweet skim milk, and gained 591 pounds.

Lot I consumed 330 pounds of barley meal and 398 pounds of sweet skim milk for 100 pounds of gain.

Lot II consumed 306 pounds of corn meal and 371 pounds of sweet skim milk for 100 pounds of gain.

Again there is a difference of about 8 per cent. in favor of corn over barley.

These experiments showed that, when feeding barley, care should be taken to prepare the food so as to render it palatable. Hogs will eat corn meal in almost any shape, dry, wet, or even sour; when fed barley meal, their preference calls for considerable soaking in a comparatively large quantity of water.

Our results show that barley is not quite so valuable as corn, pound for pound, for laying on fat, but we must remember that corn has a very high feeding value in such cases as this. Our prime use for barley is in giving the farmer an additional variety of feed. As a rule, we have too few kinds of feed upon our farms, and we rely too much on corn. In barley, we have a feed capable of building bone and muscle, and serving a generally useful purpose on the farm. In California it is the almost universal horse feed, and no animals have more endurance than those raised and fed on rolled barley. Barley is the common grain feed of England and North Europe. In the light of these facts, why should our farmers longer harbor any prejudice against it?

SORGHUM SYRUP SKIMMINGS AS A FOOD FOR PIGS.

Whenever cane juice is reduced to syrup or sugar, a large amount of skimmings is produced, which have usually been allowed to go to waste in most manufactories. The effort was made to determine the value, as food for pigs, of the skimmings obtained during the manufacture of sugar from Amber cane.

In the process employed, the juice was heated to boiling in a defecating tank, where, by the addition of lime, an alkaline reaction was obtained. The heavy blanket of scum taken off this tank formed the main bulk of the skimmings fed. The remainder was made up of such scum as might rise during the evaporation of the juice. The skimmings were collected in barrels, and were fed without treatment of any kind to pigs. Four lots of pigs, with two in each lot, were placed in separate pens, October 10, and for three days fed exclusively on the skimmings. On October 13, each lot was weighed, and from that date each received separately prepared food.

To lot I was fed the skimmings alone.

To lot II was fed skimmings and four pounds of corn meal daily.

Lot III received skimmings and four pounds of unground cane seed.

Lot IV received skimmings and eight pounds of unground cane seed.

The cane seed was one year old, and somewhat musty, yet capable of germinating, if planted. Each lot received all the skimmings that could be eaten. No

account was kept of the quantity thus consumed. The following table shows the weight and gain of each lot:

* TABLE showing results of feeding trial.

LOT.	Weight Oct. 13.	Weight Oct. 20.	Gain.	Weight Oct. 27.	Total gain.
I.....lbs.	242	255	13	261	18
II....."	223	244	21	265	41
III....."	240	255	15	266	29
IV....."	231	256	25	269	38

It would seem from this experiment that skimmings, when fed alone, are more than capable of sustaining the bodily functions, and when fed in connection with some dry food, as meal or cane seed, are quite valuable. The four pounds of meal fed daily to lot II would be all required, I think, for keeping up the bodily functions. That is, the two pigs could no more than hold their own weight and live on that quantity of food, so that this gain of nearly 42 pounds in 14 days may be credited to the skimmings.

We may say, then, that the skimmings may safely be fed to pigs to sustain life, either alone or in connection with other food, to add flesh and fat. As they are an abundant product at the syrup factories, it will, doubtless, pay the manufacturers to give attention to their utilization.

SORGHUM SEED AS A PIG FEED.

Two lots of pigs, of four each, were fed as follows: Lot I, Amber cane seed meal; lot II, corn meal; the pigs were fed all they wanted; the meal was fed wet in the first and second trials of the experiment, and dry in the third and fourth trials. The experiment lasted from December 17, 1883, to April 17, 1884.

The average quantities of feed required for a pound of pork in the various trials will be found in the following table:

TRIALS.	Corn meal.	Sorghum-seed meal.
First.....lbs.	4.2	8.0
Second....."	4.5	10.2
Third....."	5.1	9.0
Fourth....."	5.2	7.5

Accordingly, sorghum-seed meal was found, on an average, to have a value of about 55 per cent. that of the corn meal.

From trials on the experimental farm, the amount of seed produced by Amber cane varied from 1,437 pounds to 1,696 pounds per acre. Even at the low value, as ascertained from our feeding trials, no farmer can afford to waste the seed when it has been grown and lies in the field after the stalks have been removed for syrup or sugar making. If no other use is made of them, the heads of cane seed should be gathered up and thrown to fattening hogs, thus affording variety to the food and saving corn.

IV.—The Effect of Preparation of Food on Rate of Gain.

COOKED versus UNCOOKED FOOD FOR SWINE.

Four lots of three hogs each, 179 days old, were fed for three weeks, as follows: Lot I was fed one part shorts, two parts shelled corn, thoroughly cooked by steaming; lot III was fed as lot I, but the feed was uncooked. Lot II, two parts shorts,

one part corn, thoroughly cooked by steaming; lot IV, same feed uncooked. The results were as follows:

TABLE showing results of feeding trial.*

RATION.	Shorts.	Corn.	Weight of hogs.	Gain.	Cost of food.	Cost of 100 lbs. pork.
LOTS I, III.						
Cooked food.....lbs.	165.5	331.0	464	82	\$3 08	\$3 70
Uncooked food.....“	180.0	360.0	447	110	3 36	3 00
LOTS II, IV.						
Cooked food.....lbs.	286.0	143.0	467	82	\$2 83	\$3 40
Uncooked food.....“	293.0	146.5	437	94	2 90	3 10

The results show an average loss by cooking the food of about 50 cents for each 100 pounds of pork made, besides the labor of preparing the food.

COOKED *versus* UNCOOKED FOOD FOR SWINE.

This article gives a review of the experiments made at this and other stations in regard to this subject, as well as the opinions of agricultural writers and scientists on the subject. The experiments reported from this station in this report were made with barley meal, corn meal and shorts, and corn meal alone, making three trials in all. The summary of results shows that the following results were obtained in the various experiments:

Agricultural Experiment Station, Wisconsin.

Cooked barley meal (four trials) was to uncooked as..... 93.7 to 100
 Cooked corn meal (two trials) was to uncooked as..... 81.0 to 100
 Cooked corn meal and shorts (two trials) was to uncooked as..... 96.1 to 100
 Cooked whole corn and shorts (two trials) was to uncooked as..... 85.8 to 100

Ontario Agricultural College.

Cooked peas (two trials) were to uncooked as..... 84.9 to 100

Michigan Agricultural College.

Scalded corn and oat meal was to wet meal as..... 101.7 to 100

Kansas Agricultural College.

Cooked shelled corn was to uncooked corn as..... 84.0 to 100

Iowa Agricultural College.

Cooked shelled corn (two trials) was to uncooked as..... 82.3 to 100
 Cooked corn meal (two trials) was to uncooked as..... 73.3 to 100

Maine Agricultural College.

Cooked corn meal (nine trials) was to uncooked as..... 82.9 to 100

It will be noted that in every instance but one, that at the Michigan Agricultural College, there is a loss resulting from cooking; in the exception the gain is very slight, being less than 2 per cent. Even in this case the meal was not really cooked, but scalded by boiling water being poured on the meal in a pail and covered up, while the other meal was fed wet with water.

The data presented seem ample to warrant the statement that there is a positive loss in cooking food for fattening hogs. Hogs fed on dry food consume it much more slowly than when fed wet; it required over 40 minutes for hogs fed on dry barley meal to consume a ration, while on cooked meal they ate it up in 10 minutes; on corn meal the time was 20 to 9 minutes. Digestion experiments have proved

that cooking decreases the digestibility of food, especially the nitrogenous components of the same.

COOKED POTATOES FOR FATTENING HOGS.

The experiment was conducted for the purpose of determining the value of potatoes for fattening hogs. The trial lasted 42 days, with hogs about 10 months old. There were three hogs in each of the first four lots, and two in the last two lots. The potatoes were cooked with so little water that the mass, after becoming thoroughly soft, weighed no more than the raw potatoes did in the beginning. It was found that the hogs did not like the potatoes when much water was used in cooking. The meal fed was mixed with the potatoes immediately after cooking. The results were as follows:

Food required to produce 100 pounds gain.

Lot I, 438 pounds corn meal only.

Lot IV, 310 pounds corn meal.

Lot II, 290 pounds corn meal.
870 pounds potatoes.

620 pounds potatoes.

Lot V, 441 pounds of corn meal only.

Lot III, 307 pounds shorts.
920 pounds potatoes.

Lot VI, 234 pounds corn meal.

707 pounds potatoes.

Lots I and V were fed alike; also II and VI. Combining the results, we have:

(a) 440 pounds corn meal produced 100 pounds of gain.

(b) 262 pounds corn meal and 789 pounds of potatoes produced 100 pounds of gain.

This shows that 789 pounds of potatoes, when cooked, took the place of 178 pounds of corn meal, or 443 pounds of potatoes were required to take the place of 100 pounds corn meal. This makes one pound of corn meal worth nearly $4\frac{1}{2}$ pounds of potatoes. We expected more favorable results than these, but such are the facts obtained; as there were several lots of animals experimented on, it is hardly possible that our results are very far from the average.

The potatoes and roots generally must be cooked to be eaten satisfactorily by hogs. These articles alone seem to form an exception to the rule that it generally does not pay to cook food for swine.

WET *versus* DRY FEED FOR HOGS.

Six hogs, divided into two lots of three each, were fed for 68 days on equal parts of corn meal and shorts, the one lot receiving the feed dry and the other lot receiving it wet. During a second period the feed of the lots was reversed. The hogs weighed about 115 pounds each at the beginning of the trial. The results will be seen from the following table, which also includes those of a duplicate experiment with four hogs conducted at the same time and under similar conditions as the one just mentioned.

TABLE of results with wet vs. dry feed for fattening hogs.

LOTS.	Wet feed.			Dry feed.		
	Weight at begin- ning.	Gain.	Feed eaten.	Weight at begin- ning.	Gain.	Feed eaten.
<i>First experiment.</i>						
I.....lbs.	346	165	622	518	128	658
II....."	504	172	739	343	127	570
Totals.....		337	1,361	.....	255	1,228
<i>Second experiment.</i>						
I.....lbs.	343	111	508	467	98	511
II....."	448	109	532	331	63	472
Totals.....		220	1,040	.....	161	983

In no case did the hogs do as well when fed on dry feed as when their food was wet; it is quite apparent that we lost feed by not wetting it. The hogs ate most when fed wet feed; according to the writer's experience, other things being equal, hogs ought to be fed in such a way as to get them to eat the largest quantity without waste in a given time.

SUMMARY OF PIG-FEEDING EXPERIMENTS AT THE WISCONSIN STATION, 1883-'88.

The following tables of summary of pig-feeding experiments conducted at the Wisconsin station up to the year 1888 are presented, to enable the reader to obtain a comprehensive view of the results of the various experiments so far undertaken. The more important data are brought together in the tables:

SUMMARY of pig-feeding trials at the Wisconsin station, 1883-'88.

KIND OF FEED.	No. of animals fed.	Total weight at beginning of trial, lbs.	Number of days of trial.	Gain, lbs.	Amount eaten, lbs.	Time of year of trial.
Whole corn.....	2	435	14	45	233	Mar.-Apr.
	3	652	28	92	756	Feb.-Mar.
	3	692	28	90	792	Feb.-Mar.
Corn meal.....	2	105	25	42	169	July-Aug.
	2	172	25	61	253	Aug.-Sept.
	2	123	18	33	168	September.
	3	188	42	104	558	July-Aug.
	3	616	23	77	432	January.
	3	657	23	85	365	February.
	3	270	136	291	1,690	June-Nov.
Corn meal, cooked.....	2	146	98	202	942	Dec.-Mar.
	3	597	23	64	400	January.
	3	715	23	78	406	February.
Barley meal.....	3	379	23	85	400	October.
	3	450	23	50	430	November.
	3	493	23	67	395	December.
	3	586	23	81	380	January.
Barley meal, cooked.....	3	390	23	46	392	October.
	3	465	23	68	406	November.
	3	497	23	76	397	December.
	3	611	23	69	380	January.
Shorts.....	3	176	42	95	501	July-Aug.
Sweet skim milk.....	2	113	25	50	1,168	July-Aug.
	2	153	25	79	1,264	Aug.-Sept.
Two parts corn and one part shorts..	3	550	28	102	673	Jan.-Feb.
	3	587	28	105	746	Jan.-Feb.
	3	447	21	110	540	Winter.
Two parts corn and one part shorts, cooked.....	3	464	21	82	496	Winter.
One part corn and two parts shorts...	3	437	21	94	439	Winter.
One part corn and two parts shorts, cooked.....	3	467	21	82	439	Winter.
Corn meal and shorts, half and half..	3	185	42	107	469	July-Aug.
	3	390	23	89	407	October.
	3	507	23	64	443	November.
Corn meal and shorts, half and half, cooked.....	3	410	23	76	400	October.
	3	493	23	64	428	November.
Corn meal and shorts, half and half, fed dry.....	3	343	34	127	570	Sept.-Oct.
	3	512	34	128	658	Oct.-Nov.
	2	331	34	63	472	Sept.-Oct.
	2	467	34	98	511	Oct.-Nov.
Corn meal and shorts, half and half, fed wet.....	3	346	34	165	622	Sept.-Oct.
	3	504	34	172	739	Oct.-Nov.
	2	343	34	111	508	Sept.-Oct.
	2	448	34	109	532	Oct.-Nov.
One part corn meal and two parts shorts.....	2	145	98	162	818	Dec.-Mar.

SUMMARY of pig-feeding trials at the Wisconsin station — Concluded.

KIND OF FEED.	No. of animals fed.	Total weight at beginning. lbs.	No. days of trial.	Gain, lbs.	Amount eaten.		Time of year.
					Grain, lbs.	Milk, lbs.	
Corn meal and sweet skim milk...	2	118	18	59	77	403	September.
	2	122	18	76	70	733	September.
	2	124	18	76	156	257	September.
	2	295	25	128	297	1,039	June.
	2	300	25	100	148	1,485	June.
Corn meal and shorts, equal parts, and sweet skim milk.....	3	?	96	420	1,445	2,890	July-Sept.
Corn meal and shorts, equal parts, and buttermilk.....	3	?	96	382	1,445	2,890	July-Sept.
Corn meal and sweet skim milk...	3	772	30	176	674	337	April-May.
	3	958	30	154	536	268	June-July.
	2	350	30	104	432	216	April-May.
	2	466	30	94	362	181	June-July.
Whole corn and skim milk.....	3	785	30	146	704	352	May-June.
	3	953	30	104	497	248	June-July.
	2	330	30	93	306	153	May-June.
	2	446	30	77	308	154	June-July.
Corn meal and skim milk.....	6	732	55	496	1,572	4,716	Feb.-April.
	2	142	98	239	638	1,962	Dec.-March.
Corn meal and buttermilk.....	3	116	135	553	1,183	4,140	July-Nov.
	3	108	135	424	1,229	1,117	July-Nov.
	3	108	135	372	1,263	421	July-Nov.

FOOD REQUIRED FOR 100 POUNDS OF GAIN WITH HOGS.

From the foregoing table, a second can be deduced which will be more available, and useful for reference. In this, the quantity of food required for 100 pounds of gain and live weight is given, together with the season of the year of the trial, the number of trials, the total number of animals fed, and their average weight at the beginning of the trials. All the results that might be derived from the previous table are not here inserted, as they would only tend to confusion.

The reader is asked to bear in mind that these figures are only preliminary ones, and that future trials may somewhat modify them. The writer considers that the quantity of corn meal required to produce 100 pounds of gain with shoats, in summer, as here stated, is too high, and that 500 pounds of meal for 100 pounds of gain in summer, with animals of such weight, is ample. Of course, the figures must be given just as we find them.

TABLE showing the quantity of feed required to make 100 pounds of gain with hogs.

KIND OF FEED.	Time of year.	No. of trials.	No. of animals.	Av. wt. in lbs. at beginning of trial.	Lbs. of food required for 100 lbs. of gain.
Whole corn.....	Winter...	3	8	229	784
Corn meal.....	Summer..	5	12	71	534
Barley meal.....	Winter...	3	8	177	517
Shorts.....	".....	4	12	159	567
Sweet skim milk.....	Summer..	1	3	58	525
Half corn meal, half shorts (dry).....	".....	2	4	66	1,877
Half corn meal, half shorts (wet).....	Fall.....	4	12	137	531
	".....	4	12	136	431
Corn meal and sweet skim milk.....	Summer..	5	10	95	{ 147 meal. 892 milk.
" " " ".....	".....	4	10	254	{ 379 meal. 189 milk.
" " " ".....	".....	4	10	251	{ 432 meal. 216 milk.

While small changes may be made, as indicated, still the table will, in general answer the important question often asked, how much feed for 100 pounds of pork.

RELATION BETWEEN WEIGHT OF HOGS, GAIN MADE, AND FOOD REQUIRED FOR 100 POUNDS OF GAIN.

The following summary presents in a condensed form the results of over 100 feeding trials conducted at this station, with over 300 hogs, varying in weight from under 50 pounds to over 300 pounds.

TABLE giving the relation between weight of hogs and food eaten, gain made, and food required for 100 pounds of gain.

GROUP.	Weight of group in lbs.	No. of hogs in group.	Average weight per hog, in lbs.	Lbs. food eaten per hog per day.	Lbs. gain per hog per day.	Lbs. of food for 100 lbs. of gain.
No. 1.....	Under 50	12	48	2.36	.864	273
No. 2.....	50 to 100	48	79	3.38	.908	372
No. 3.....	100 to 150	71	127	4.11	.940	437
No. 4.....	150 to 200	97	176	5.89	1.023	479
No. 5.....	200 to 250	49	212	6.93	1.240	561
No. 6.....	250 to 300	23	266	7.18	1.415	507
No. 7.....	300 to 350	6	340	6.07	1.433	423

LENGTH OF INTESTINES OF HOGS.

Darwin states that the nature of the food supplied during many generations has apparently affected the length of the intestines. In the wild boar, their length to that of the body is as 9 to 1; in the common domestic boar as 13.5 to 1, and in the Siam breed as 16 to 1. In four hog experiments made at this station where the animals were killed at the completion of the experiment, careful measurements of the intestines have been made, and the average ratio for 39 hogs included in the experiments is as 21.5 to 1. This wonderfully increased length of the intestines may very properly be supposed to show that the power of the digestive apparatus in the modern hog has been greatly increased. It may not be that he can digest his food more thoroughly than did his ancestors, though I suspect he can, but it is possible that he is enabled to eat larger quantities of feed in a given time, and therefore give better returns for what is fed him.

PRACTICAL CONCLUSIONS DRAWN FROM EXPERIMENTS IN PIG FEEDING, 1883-'89.

All things considered, the hog has been the most profitable animal on Western farms, and no small part of the wealth of the Western states is due to this one animal. Corn is and has been the most universal food for swine in this section, and so it is to Indian corn that we are indebted for the benefits accruing from the hog. No other plant furnishes so much available food to the acre, or food that is so well relished by the hog as corn. With millions of acres of land devoted to corn growing, and a large part of this corn being fed to hogs, it is no wonder we have come to regard corn as made for the hog and the hog for corn. To one who first acquaints himself with the situation it might appear that all the farmer has to do to increase his income is to plant more corn and raise more hogs, but the investigator will soon find that, were the market open to all that could be raised, there seems a limit to the pork production of any farm or locality, for numerous difficulties beset this vocation. Pigs are born only to meet an early death; hog cholera devastates large areas, passes from point to point with great rapidity, clearing everything before it, leaving the farms not only without swine, but so inoculated with the disease that all the business in that section must be held in abeyance for a year or more.

Farmers are constantly complaining that their hogs become too fine boned, and get but temporary relief by sending off to breeders for coarse-boned sires. These facts show that, as now handled on the average farm at the West, the hog is in an abnormal condition and that degeneration is constantly going on, or, popularly stated, "stock runs out." The difficulties in the way do not end with the troubles named, but follow the hog even after death, into the pork barrel. Foreigners claim that our pork is diseased, and place an embargo upon it. Home consumption is decreasing, not because our people think the pork is diseased in itself necessarily, but because the meat is so excessively fat that there arises a strong aversion against it in the minds of most people. As people in the lower classes in life get ahead in the world they give up pork for more expensive meat. Not only, then, have we to consider the questions of hog feeding from the standpoint of feeder and breeder, but the opinion and wish of the consumer must receive attention, if this industry, of such great magnitude, is to continue on a sound basis.

That with proper care the form, size, substance and bone of the hog can be well maintained, and even advanced, is shown by the fact that careful, intelligent breeders and specialists hold their stock up to a high standard of excellence, and even improve it. Nor is it difficult for the intelligent farmer to keep his stock where it will yield a satisfactory profit. First of all, there must be a careful discrimination between the hogs used for breeders and those intended only for feeders. Breeding from immature stock must be avoided as much as possible, for this is probably one of the greatest sources of the present lack of constitution. To fatten brood sows after they have farrowed off litters once or twice is a practice, most unfortunately, altogether too common. Good mothers should be held for breeders as long as possible. The care of the pig must begin before it is born, by not only giving the dam comfortable quarters, but supplying such food as is essential for the building up of the bodies of her young. During pregnancy, the sow should receive plenty of protein food, in the shape of blue-grass or clover pasture, bran, shorts, middlings, ship stuff, skim milk, and peas. It is impossible to keep brood sows through the winter on Indian corn alone and have good results at farrowing time. Even if large litters of pigs are successfully brought into the world by dams so fed, there must be a weakening of constitution which, sooner or later, will bring disastrous results. Since it is the cheapest food on the list, corn very properly may form part of the ration of hogs at all times, but to cause a brood sow to not only maintain her own life, but to grow the bodies of a litter of young from the elements contained in the daily ration of corn, is simply out of the question. There are not enough bone and muscle elements in the corn a brood sow can consume to suffice for building up the bodies of her young.

Unless the farmer has the proper buildings and conveniences for attending to the wants of brood sows, it is better to have the pigs born in the summer time, when the mothers are running on pasture, for with pigs brought into the world under such conditions the risk is reduced to the minimum. When born, it is profitable to push the pigs forward as rapidly as possible by feeding the mother heavily on nutritious diet, which should contain a very considerable quantity of protein and ash elements, since the bodies of young pigs expand rapidly and should be built up in bone and muscle and not fat. The cheapest gain made by hogs at this station was when feeding sows with young pigs so heavily that they even gained in weight while suckling their young. Less than three pounds of feed then made a pound of gain. Having grown a strong, muscular frame, the time comes when the farmer must separate the breeding stock from the remainder of the herd, and give it different treatment. Breeding stock should be kept out of doors, on pasture as much as possible, and every attention given towards keeping the animal natural and healthy. The final

purpose to which hogs for the market are intended must direct the way in which they are handled. With a well-grown carcass of 100 pounds for a basis, hogs which are intended for the general market can be fed almost exclusively on corn, adding a little ground oats, shorts, skim milk, or other protein food. As far as possible, however, in these times of low prices, hogs should be grown on pastures, and corn used only to ripen up the animal. On our Western farms, land is the cheapest and labor the dearest thing we have. The hog that runs in a clover field or blue-grass pasture waits on himself, and makes a healthy growth, if not a very fast one. This growth is usually more profitable than that made from entire grain feed. Usually a part ration of grain can be profitably fed to grazing hogs to hasten their growth.

Where the general market is the destination, one cannot be over particular about the pork product, but must manage it at all points in the very cheapest way.

Farmers who are fattening steers should try feeding shelled corn and putting hogs with them. Our experience shows that the farmer who stanchions or ties up steers, and gives corn meal for the main feed, produces about the dearest beef that can be made. Let the steers run loose in an open yard or shed, with a good, vigorous shoat for each steer. The shoat may yield some profit to the owner, if the steer does not.

There is a growing demand for clean, wholesome pork, which should be catered to by intelligent farmers. Thousands of people are willing to pay increased prices for pork made from healthy, well-fed animals, kept in a cleanly manner. There is no reason why farmers cannot coöperate, and establish small packing houses which shall send out smoked ham, breakfast bacon, sausage and lard which will be eagerly bought up at good prices by a discriminating public. The marvelous growth of the creamery business in the West, during the last decade, hints at what may be done in the pork trade. If the butter trade of the West was controlled by a few operators in Chicago, who received the whole product and distributed it back again to the people, there would be no demand for intelligent dairying. A pound of butter oil produced by one party would sell for as much as that produced by another, and the large manipulators would make all the profits. A market for choice pork must be created and enlarged, and the public properly informed of the situation, before this matter will take proper shape. The plan is feasible, and certain, sooner or later, to be brought about.

Hogs fed to produce a large percentage of lean meat must, to be profitable, sell for at least 20 per cent. more than current prices. A discriminating market will soon pay the difference. Every animal requires a certain amount of food for its maintenance. The hog is no exception, and in feeding we should remember that he will attend to his own bodily wants first of all, and only lay on flesh afterwards. With his wonderful appetite and immense digestive powers, it is the height of folly to keep the hog on part rations. It is the satisfied, quiet hog that brings money to the owner. On the other hand, we have found that our best gains came from hogs so anxious at meal time for their feed that they would show their greedy appetite by squealing. We do not believe in the practice of keeping feed before the hog at all times. In order to make first-class pork, cleanliness is the first requisite. Not only should the pigs be kept in clean quarters, but their food should be clean and wholesome.

The dairy farmer is well situated for producing this kind of pork, since skim milk and buttermilk are rich in both protein and ash. Where the largest gain only is considered, we have not found it advisable to feed over two or three pounds of skim milk to one of corn meal. A larger amount of milk would give a somewhat increased amount of lean meat, but hardly enough to pay for the increased cost which the milk would necessitate. The limit for the amount of milk to meal, just given,

should not be exceeded, but additional protein food furnished in the form of oats, shorts, or pea meal. Where peas can be grown, they are admirable protein food, and should make a choice quality of pork. Peas can be sown broadcast in early spring, and when ripening can be fed down by hogs at no expense for gathering the crop. Our feeding trials show that oats are an admirable accompaniment to corn, the combination giving the best returns we have made, excepting skim milk and corn meal. The protein and ash of the oat reinforces the corn meal, and the combination should give pork of fine quality. It is believed that there is a limit to the amount of lean meat which can be produced in a hog's body. An excessive proportion is certainly not as desirable as it might seem at first thought. Unless there is a due proportion of fat interlarded with the lean, marbled, as we commonly say, the meat will be flavorless. The flavor of good meat comes, quite largely no doubt, from the mixture of fat with lean. This should be borne in mind in producing meat of good quality. High-grade pork will not permit the hog from which it is made to become too heavy, since most of the increase, after reaching a certain point, is only fat. Two hundred or 250 pounds is probably the limit for the best class of carcasses of the kind under consideration, with the large breeds common at the West.

In this review of our work, we started out with a statement of the prevalence of corn for hog feeding at the West. All through our work we have been surprised at the power of this grain for producing gain. We have also been surprised to see how perfectly satisfied the hog was when existing upon a corn diet. It is plain to anyone who studies the subject, even casually, that as the prosperity of the West in the past has been based upon corn, so corn must continue to be the great money-making crop of that section. If pork raising is to continue one of the leading industries, a large part of the product must continue to be the result of feeding corn. There is no doubt but what corn makes pork of fine quality and great firmness, if properly fed. It should be distinctly borne in mind, then, that we have not a word to say against the use of corn for pork production. It is against the abuse of corn, and not its use, that we have written. Intelligently fed, corn is all right; only in its abuse is there any wrong. There need be no less corn fed, but more protein food should be given, such as clover, blue grass, oats, and other grains, along with the corn now given them.

We cannot close this article without alluding briefly to the importance of feeding ashes to hogs. Many farmers are obliged to feed corn in large quantities upon prairie farms, where hard-wood ashes are scarce or unknown, and yet upon these very farms there is the greatest need of ash material for aiding in building up the bone of hogs. Corn cobs furnish a very strong ash, and should be burned and the ashes carefully saved and fed to the hogs.

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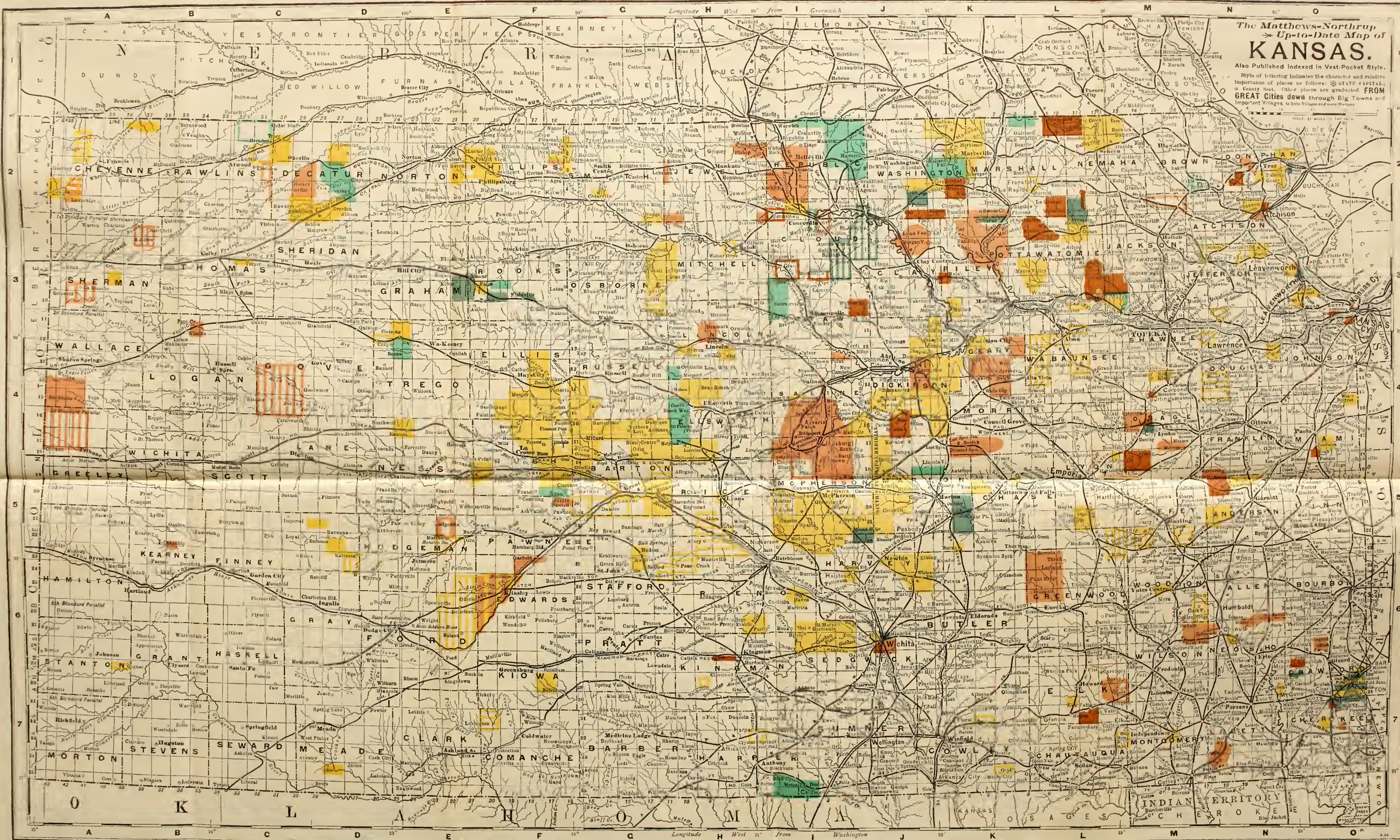
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MAP OF FOREIGN SETTLEMENTS IN KANSAS.

Compiled by W. H. GARRUTH, Professor of German in the State University.



The Matthews-Northrup
Up-to-Date Map of
KANSAS.

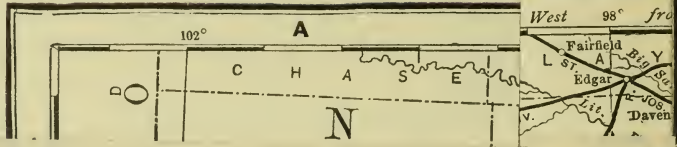
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Style of lettering indicates the character and relative importance of places as follows: STATE CAPITAL, County Seat. Other places are graduated FROM GREAT Cities down through Big Towns and Important Villages, to Little Villages and more remote places.

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